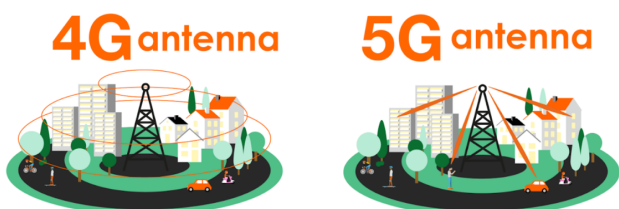# 5G CONTROVERSIES IN EUROPEAN CITIES

**5G is a new technology that has crystallized many tensions at the national and local scales in Europe since the beginning of its deployment in 2020. Our research explores the urban governance of 5G, more specifically the actors, objectives, stakes, challenges and controversies linked to this new technology in cities.**

## WHAT IS 5G?

- 5G is the fifth generation of mobile telecommunications, but it functions differently than the existing 2G, 3G and 4G systems. Whereas those networks are based on antennas that cover a specific area and constantly emit a signal. 5G antennas only work when there is a demand for signal, thus limiting useless waves and improving energy efficiency. 5G has also better performance concerning the latency and debit.
- 5G rollout necessitates new antennas and compatible smartphones, thus there is a risk of generating lots of waste.
- There are different frequencies used for 5G. Currently, 5G works with two frequency bands (700MHz-2,6GHz and 3.5GHz in France), which do not permit significantly better performances than 4G. But in the following years, 5G will be developed on the 26GHz frequency, which will be much more efficient.



Source: https://radio-waves.orange.com/en/radio-networks-and-antennas/5g/

5G has begun to be deployed intensively in European countries in 2020, with some delays due to the Covid-19 pandemic. The rollout of this technology was not straightforward in all cities. Indeed, 5G has been at the core of tensions and controversies between actors in several European cities. While 5G is presented as an element to improve economic dynamism and competitiveness by some actors, such as telecommunication industries and certain policymakers, others urban actors are opposed to it, invoking potential social and environmental risks.

Our research focuses on five case studies of different European cities: Geneva, Barcelona, London, Grenoble, Helsinki & Stockholm. In those cities, we studied the rollout of 5G, its origins and its impacts on the existing urban ecosystem. As the environmental impact of 5G has already been studied and debated in other research, our work focuses on the urban governance dynamics of 5G. Each city has its own specific urban context including specific actors, legal possibilities, political culture but also economic environment. We then studied how 5G inserts into those existing urban contexts, and how it provokes controversies and challenges in urban governance processes.

# CASE STUDIES

## GENEVA

- Even though Switzerland is the European country with the most extensive 5G coverage, this rollout raised controversies in Geneva. The moratorium voted in 2019 is doomed to fail because of institutional deadlocks in favor of the federal State
- The analysis of 5G emitters already installed countrywide showed that 5G antennas are urban phenomenon items and are developed around economic centres
- By comparing antennas and their embeddedness among other economic infrastructures, we demonstrated that antennas tend to be developed following two logics affiliated to different kinds of urban areas:
  - in dense urban areas: a granular network of short-range antennas
  - in suburban areas with industrial and mixed activities

## BARCELONA

- A 5G governance marked by a myriad of pilot projects showcasing the ICT expertise of local economic actors. They act as the transmission belt of European objectives and leave a consequent room for manoeuvre to private actors
- A deployment of 5G on pre-existing economic ecosystems by public-private partnerships: there is a lack of clear direction given by the city to transform this innovation into an improvement for the city
- In the Poblenou district, 5G is a servicial component in a wider urban development project which aim relates to business attractivity

## LONDON

- 5G is part of a digitalization strategy pursued by the Greater London Authority in the context of diverse public-private partnerships
- Focus on the role of 5G in transportation systems: 5G uses are not yet focused on infrastructures management but more on the passenger's experience (access to 5G for the consumers during the travel)
- 5G as a window of opportunity for London's position and autonomy vis-à-vis the State. Gaining technical competences (i.e., cybersecurity) and economic attractivity tend to strengthen London's political power.

## HELSINKI & STOCKHOLM

- Similar political, economic and cultural environments favorising trust in public institutions, powerful innovation clusters driven by two major telecommunication groups Nokia and Ericsson, and symbiosis between the different public and private urban actors
- Key role of the municipality as facilitator and coordinator of the 5G rollout
- 5G as a tool for the development of the smart city and integrated to pre-existing public policies
  - a focus on open data and citizen service in Helsinki
  - an integration to environmental objectives in Stockholm

## GRENOBLE

- A city divided between its technological ambitions and its environmental ambitions
  - Grenoble is one of France's major innovation clusters and there is historically a close cooperation between local actors
  - The city is led by a Green municipality since 2014 which tries to implement ambitious climate plans and today opposes 5G deployment on environmental and ideological grounds
- 5G as a political symbol of the opposition between those two ambitions: an object that crystallizes the tensions
- The local controversies echo the tensions at the national level, and illustrate a deeper debate on the role of cities and State

## 5G: A NEW TECHNOLOGY DRIVING CHANGE AND CREATING MANY CHALLENGES FOR CITIES

### 5G has a particular place in the urban environment

5G antennas are developed in particular contexts, as highlighted in the different case studies. They are integrated to a pre-existing specific urban environment and their visibility makes them a component of the public space. 5G, as such, has also become an object that crystallizes tensions, fears and even fantasies. 5G controversies seem to be the result of a broader climate of distrust between citizens and their governments, exacerbated by the lack of democratic debate and transparency prior to the rollout. On the other hand, 5G also represents a key part of smart city strategies and many urban actors see in the new technology an useful tool for future urban policies. This is supposed to improve the inhabitants' lives and the knowledge of the city, even though it is yet too early to say if 5G can really improve the governance of cities. Finally, the 5G technology, and the likely environmental negative impacts linked to its deployment, highlight once more that cities are the central stage for the fight against climate change: what matters is how 5G is going to be rolled-out and used in cities.

### 5G represents two major stakes for urban policy-makers

5G seems to divide urban actors because of the ambiguous relationship it holds with technique. 5G enthusiasts see in this innovation an intrinsic improvement, and belive that 5G will be key to reinforce the competitiveness of the city and attract new businesses opportunities. Other actors argue that 5G is a technology which still contains many uncertainties, as for instance there is a lack of precise knowledge regarding the sanitary impacts of waves, which makes them more cautious. Some have used the precautionary principle to ask for a delay or an annulation of 5G rollout. 5G can also be seen as an economic uncertainty (no one can tell if it will be a flop or a real game-changer), a democratic uncertainty (due to the lack of consultation and debate before the rollout, which has led to different reactions depending on the urban context), and an environmental uncertainty (the impacts on the environment are debated, particularly on the question of a potential rebound effect).

## WHY DOES 5G MATTER FOR URBAN GOVERNANCE?

### The governance of 5G is fragmented horizontally and vertically

5G is developed through a vertical interplay between different levels of public action, which makes its governance very fragmented. On the top level, the European Union establishes the strategic priorities of the development and funds research programs and pilot projects to demonstrate the applicability of 5G in cities. Next, States also play a major role in 5G deployment, as they organize concretely the priorities and modalities of the rollout, which differ depending on the national context (relationships with operators, local authorities...). On the other end of the spectrum, cities represent the closest level of governance for the implementation of 5G and thus face the most difficulties since it gets out of the technical sphere at this level.

On the horizontal level, the deployment of 5G must be understood in a context of global competition between companies, but also territories and supralocal entities. There appears to be a trend towards a weakening of the public sector regarding the urban governance of 5G. Indeed, 5G seems to be deployed to respond to agendas of territorial competitiveness (with

a sense of urgency) and is often seen as an imperative to fulfil the (potential) needs of the economic ecosystem. It does not follow a concerted and planned long-term urban strategy.

Finally, the tensions and controversies concerning 5G deployment, or the lack thereof, can be better understood by looking at actors' broader attitude towards technology. On the one hand, pro-5G actors emphasize discourses linking innovation to improvement, and have strong beliefs that technological progress is an imperative for cities' well-being. On the other hand, actors opposed to 5G are embedded in a wider distrust towards technology, often perceived as something destructive for socio-ecological environments. There is a strong trend towards a polarization of the debate and a lack of nuance, which does not leave much room for a balanced position.

## 5G represents major challenges for the governance of cities

5G is now a feature of European cities, even though its top-down imposition has created institutional, economic and technical locks, and an open, peaceful public debate on the matter has been rendered impossible. The way 5G (as previous digital infrastructures) has been developed has generated its share of difficulties and is today confronted with urban materiality and the particular socio-economic environment of cities. 5G remains a technology which crystallizes many tensions and uncertainties, and certains of its implications need to be carefully accounted for. Thus, it would enable 5G to keep its promises but also ensure a clever use of this innovation, at the service of both economic and socio-environmental progress. Public authorities have a role to play in the informational empowerment of all actors and also in making room for manoeuvre for action.

From the point of view of urban governance, 5G rollout reveals the shortcomings linked to decision-making processes on digital questions. Some of the criticisms addressed to smart cities can be applied to 5G, particularly the technocratic governance put in place or the lack of questioning of this techno-solutionist approach, which leaves no room for public debate. There is a need for a new paradigm in the way governance of digital technologies is handled, which would both enable better coordination between the actors at the vertical and horizontal levels, and also question the notion of improvement related to technological innovation.

This research has revealed the fragmentation of 5G governance and the key role that local actors play in the deployment of this technology, hence highlighting the mismatch between broad strategic decision-making and actual network implementation in the urban context. It appears that 5G deployment could benefit from an increased flexibility and subsidiarity regarding the way decisions are made. Municipal authorities could be tasked with coordinating between actors at the local level, informing the population, and generally adapting the European or State policies to local circumstances and constraints. Moreover, public authorities are ideally the guardians of the common good. They are thus the institution which should have a strategic vision concerning 5G and bridge the gap between what 5G is as an innovation, and what 5G should be as an improvement. Cities are the ones who could enable a democratic debate to get all actors engaged, plead for parsimonious uses of digital technologies and finally facilitate the finding of a desirable outcome concerning 5G.

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