



The fifth generation of telecommunications system (5G) deployment in cities

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The EU should ensure

1. Balanced and fair 5G deployment by fostering equal distribution of 5G networks in less densely populated areas, helping reduce the digital divide in cities, and safeguarding EU net neutrality rules to offer equal opportunities to all local ecosystem actors.
2. Responsible and safe 5G deployment by coordinating information on the real impact of 5G on human health and environment, and by providing funding to support research to study possible long-term effects and implications.
3. Sustainable 5G deployment in cities developing common EU protocols on the design of small cell devices to preserve the visual identity of public spaces.
4. A common and simplified EU regulatory framework on the use of public infrastructures to deploy 5G. The framework should clearly define telecom operators' liability rules to guarantee public security and safety as well as rules on new costs coverage for the management of these infrastructures.
5. Clear governance rules about 5G data sharing platform management together with clear responsibility and liability measures on data management. EU legislative action should ensure access and use of 5G business to government (B2G) data sharing in the proposed Data Act.
6. Strengthened collaboration with city governments for the full deployment and implementation of 5G, which includes developing and testing future fit policies and projects on the use and impact of new technologies.

5G in cities

The fifth-generation wireless telecommunications standard (5G) is one of the key strategic technologies necessary to boost digital transformation in European cities. By enabling high speed connectivity, low-latency, and the ability to handle a massive number of connections, 5G will facilitate many new smart city applications and services, especially transport, public safety and security, and citizen services.

Since 2018, 5G roll-out has started in cities across Europe. Vertical trials, pilots and first commercial deployment have been launched in cities, mainly in the context of critical urban infrastructure, to monitor and guarantee safety, security, health, and energy efficiency. Examples include: being a testing ground for 5G driver assistance potentially improving road safety; in harbour cities, 5G technology helps seaport production processes, logistics, industrial maintenance, and environmental supervision; in university campuses, 5G offers a

testbed for students and local companies to further advance research; in hospitals 5G has been used to trial transportation of medicines via drones and test urban mobility alternatives. Collaboration between city governments and telecommunications providers have also supported innovative 5G use-cases such as robots assisting caregivers in nursing homes or drones used for the automation of public infrastructure inspections in wastewater treatment plants.

Opportunities and challenges for cities

The ongoing COVID-19 pandemic proved that new digital technologies, such as 5G, can be crucial in the response to health emergencies. Faster, more powerful, and reliable connectivity can inform, enforce, and facilitate a wide variety of measures, if used responsibly and respecting human rights. Telehealth and remote care services improve quality of life for people, especially for the disabled and elderly, while saving time and costs. Since the pandemic started, smart working and distance learning have become routine for millions of people. These ways of working could be even more common in the future, putting home connectivity and networks under pressure. 5G can help to improve performance and ease some of the strain on home networks.

When 5G networks are coupled with artificial intelligence, robots or drones, the possibilities for new smart city applications increase exponentially. 5G deployment will improve intelligent transport systems, enable autonomous cars and vehicle-to-everything (V2X) communication services, helping local governments to increase road safety and traffic efficiency while reducing emissions and costs. 5G based CCTV¹ cameras, integrated with AI, will be able to quickly identify dangerous situations and automatically alert public authorities about, for instance, a car accident or terrorist attack. 5G is also a driver of the next generation of energy grids, enabling more robust, reliable, and efficient grids with greater capacity, lower risks of blackouts and less energy consumption. Technological advancements must be sustainable and lead to energy-efficient processes. 5G together with other new digital technologies is a key facilitator for cities to tackle climate challenges and to support the European Green Deal.²

However, future opportunities for cities are coupled with new challenges. City authorities will have to rethink the governance of public space, services provision, while ensuring citizens quality of life. City governments act as intermediaries between telecom operators and citizens, bridging the gap between different interests and needs; they monitor and ensure that local 5G roll-out safeguards the public interest. Cities' technical challenges include public infrastructure management, public resistance linked to alleged health risks and implications, societal impact as well as data management and sharing.

Deployment of small cells and public infrastructures management

The large-scale deployment and management of small cells in public spaces bring up several concerns and challenges for local governments. Firstly, the impact on urban public space. In the past, inappropriate massive deployment of fibre optic cables in heritage buildings have damaged their visual identity. The dimension (in terms of volumes) of the small cells is estimated to be up to 30 litres³ and a large number of small cells will be needed in areas with a high density of users. City governments are often responsible for preserving the visual

¹ Closed-circuit television

² EUROCIITIES reaction to the European Green Deal http://nws.eurocities.eu/MediaShell/media/EUROCIITIES_reaction_to_the_Green_Deal_2020_Final_.pdf

³ As per proposed text of implementing regulation specifying the characteristics of small-areas wireless access points pursuant to Article 57(2) of the Directive 2018/1972 establishing the European Electronic Communications Code

identity of the urban public space and the possible negative impact of cells deployment is a challenge.

Secondly, there are additional concerns and challenges for city authorities when the large-scale deployment and management of small cells relies on public infrastructure (e.g. lamp poles, road signs, traffic lights, buses, trams, and subway stations). Sharing public infrastructure with telecom operators requires defining responsibilities for the maintenance and security of the infrastructure and guaranteeing the integrity of these public services (e.g. traffic management, safety, public lighting, energy...). This is complicated as it entails specific competences, changes in regulations and establishing new practices and rules.

Finally, the deployment of 5G in cities will imply several additional management costs for city authorities, including infrastructure maintenance, liability insurance and technical controls, which will increase the city budget.

Recommendations:

- 5G deployment in public spaces must be regulated through common EU protocols on the design of small cell devices to minimise the impact on the urban visual identity and environment.
- EU accountability and liability rules and measures must be put in place to guarantee public security and safety.
- EU rules on 5G management costs coverage by telecom operators must be developed. Management costs related to 5G deployment in cities cannot be covered by local governments alone.

Public resistance for supposed health risks and implication

The possible long-term negative impact of 5G on human health is a hot topic. Some citizens believe that 5G could cause serious illnesses and misinformation campaigns are shaping public opinions. This can have negative effects on the perception of public authorities' activities and reduce trust. In several cities, local governments had to stop 5G tests and pilots as a result of protests. This can have public order implications, implementation delays and related costs. City authorities, as the level of government closest to citizens, are required to implement costly risk assessment measures, duplicating the work of other national authorities, to provide reliable responses to people about the possible health risks. The lack of clear, coordinated and official information about the scientific evidence on health impacts of 5G risks negative reactions from the public, delaying full 5G deployment in cities.

Recommendations:

- Robust and evidence-based communication, coordinated at EU level and with the involvement of city authorities, about the impact of 5G on human health and environment, is needed.
- National and European funding should continue to support research into any possible long-term effects.

Societal impact

Digital divide in cities is a key concern for city authorities. Given the high costs of deployment, as with previous 3G and 4G, the initial rollouts of 5G is expected to occur primarily in more densely populated city areas, leaving peripheral neighbourhoods behind.

This will generate new digital connectivity gaps and widen the existing ones. The poorest metropolitan and peripheral areas need to be connected for people to benefit from 5G services. City authorities have the responsibility to ensure equal distribution of 5G networks and to promote and monitor the use of services available to reduce the digital divide. We are committed to ensuring that local ecosystem players benefit from equal opportunities to grow and flourish. Net neutrality is a cornerstone of EU principle of freedom communication⁴ for the digital era and to protect and guarantee digital rights. EU laws and guidelines ensure the right to conduct business, and the freedom to innovate on the internet for all. However, 5G might put this at risk. High entrance fees for 5G network deployment and the zero-rating practice can prevent local SMEs and small application providers from accessing the market. Billing the traffic used by different applications in a different way creates inequalities and disadvantages to new and small application providers.

Recommendations:

- EU legislative and funding actions should aim at bridging the digital divide in cities. This should include a strategic use of programmes such as Horizon Europe, Digital Europe Programme (DEP), European Fund for Strategic Investments (EFSI), Connecting Europe Facility (CEF) and Structural and investment funds that also encourage 5G deployment in less densely populated areas of cities.
- The EU should make no exception for 5G technologies in the future revision of the BEREC net neutrality guidelines and future possible review of the regulation.

Data management and sharing

5G will massively affect data management in cities. With billions of connected devices, an unprecedented amount of personal and non-personal information will be produced in cities. City authorities will be key players in this process. New rules, practices and mechanisms on data collection, transferability, interoperability, storage and processing must be put in place and this will bring new challenges and costs for ensuring data consistency, reliability, as well as privacy, security and protection. Edge/fog computing infrastructure is key to 5G, with centralised core of data centres being closer to the location where it is needed, applications performances and user experience will increase. However, in terms of data, more information will need to be stored, processed and aggregated. These practices may lead to data leakages, privacy, and security breaches and, in extreme instances, high-impact cyber-attacks. The recently released European data strategy with the proposed common European data spaces and interconnected cloud infrastructures is promising to address data processing as well as interoperability and security challenges. However, at platform level there are many players involved that need to share data. The huge amount of data produced by 5G through, for instance, mobility, energy, health, and education applications, will be crucial for city authorities to produce and deliver new and better public services. However, a considerable amount of this data will be collected and owned by the private sector with no access and re-use opportunities for city authorities.

Recommendations:

- Clear governance rules at EU level about data sharing platform management, together with clear responsibility and liability measures on data management, should be established.

⁴ European Parliament resolution of 11 December 2012 on a Digital Freedom Strategy in EU Foreign Policy (2012/2094(INI))

- The newly proposed data sharing platforms is a first step to improve data sharing and foster re-use by all ecosystem players. However, access and use of 5G business to government (B2G) data sharing needs to be specifically regulated. City authorities should be involved in the development of the Commission's Data Act, currently scheduled for 2021, which must include an ambitious B2G data sharing dimension.

Working in partnership

Cities are where 5G experimentation and first deployment take place. Although 5G is not fully deployed in Europe, scientific research on 6G already started. Companies believe 6G will be needed to keep up with the super smart apps and amount of future data flow.⁵ Cities play an important role in facilitating and in guiding the development of connectivity. The role of cities in future depends on the choices made for 5G, whether connectivity will remain a fixed solution or will become more mobile. With more mobile connectivity, governance will be more difficult. Involving citizens remains one of the bigger challenges, as well as making sure all alternatives for connectivity have been taken into account. City authorities can be crucial to supporting EU policy makers in developing future fit policies on the growth and impact of new and emerging technologies and testing them with citizens.

⁵ https://www.researchgate.net/figure/Global-mobile-data-traffic-forecast-by-ITU-Overall-mobile-data-traffic-is-estimated-to_fig1_331159423