

# The Latest in Cyberlaw

## OH MY 5G!

We've been hearing more and more about 5G. This month's column is the first in a series on the new technology.

What exactly is 5G? In telecommunications, 5G is the fifth generation of cellular network technology, an evolution from 2G, 3G and 4G. Once fully deployed, 5G will be faster, more reliable, more responsive and offer a substantial increase in bandwidth. The enhanced speed and capacity will facilitate expanded use of cellular technology, opening the door for better deployment of the Internet-of-Things, virtual and augmented reality, edge computing, machine-to-machine communication, and enhanced networks for self-driving cars.

5G will bring about a significant decrease in latency, which is defined as the delay between a user's action and a web application's response to that action. Also, the new technology will enhance the ability to connect many devices to the wireless network without bogging it down.

Wired magazine noted in a September 2020 article that 5G "will

bring speeds of around 10 gigabits per second to your phone. That's more than 600 times faster than the typical 4G speeds on today's mobile phones, and 10 times faster than Google Fiber's standard home broadband service—fast enough to download a 4K high-definition movie in 25 seconds, or to stream several at the same time."

Cellular telephone companies began the process of rolling out 5G in 2019. Verizon introduced 5G mobile service in parts of Chicago and Minneapolis in April 2019, with the result that customers in those cities were the first in the world to be able to connect 5G-enabled smartphones to a 5G network. Different carriers have taken different approaches to launching 5G, some simply building on top of 4G networks, while others have used standalone networks. As of June 2020, 87 mobile operators have launched 5G services in 39 countries.



Anne F. Downey

*Continued on Page 23*



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# OH MY 5G!

*Continued from Page 19*

There are different versions of 5G: low-band, medium-band, and high-band. Governments auction off the various parts of the spectrum to cellular companies. Some networks use low-band, which has comparatively slower speeds but allows carriers to leave more distance between towers. For the user, low-band 5G feels like 4G. In contrast, high band, including millimeter-wave (mmWave) technology, offers maximum speed but less reliability over distances (best coverage within 800 feet of a tower), with the potential for disruptions due to obstacles such as precipitation and trees.

The use of high-band mmWave technology is largely a US phenomenon, with most countries opting for the mid-band approach because it means faster, cheaper and more widespread deployment of 5G networks. Mid-band is arguably the sweet spot in terms of speed and coverage. In August 2020, the FCC concluded its first 5G mid-band spectrum auction.

For consumers, trying to figure out which carrier offers which version of 5G can be confusing. As best as I can determine, the current situation is as follows: Verizon uses the high-band mmWave technology in parts of 35 cities (not including Buffalo). T-Mobile currently uses the slow low-band network for most of the US, but uses mid-band in five cities and high-band in seven cities. Now that T-Mobile and Sprint have merged, the two carriers are in the process of merging their 5G networks, including Sprint's midband-spectrum 5G service. AT&T uses low-band for most of the country and high-band in 35 cities.

To take advantage of 5G, consumers must purchase 5G compatible devices. So far only about four percent of US cell phone users have such devices. South Korea has the highest rate of consumer participation, with ten percent of its users owning 5G enabled phones. In the US, Android phones have offered a 5G version since 2019, and Apple launched its first 5G iPhone in October 2020. Not all 5G phones are the same, and many AT&T and T-Mobile phones are not compatible with the high-band 5G technology.

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The switch to 5G also necessitates the creation of software apps that will take full advantage of 5G. Major 5G applications are expected to be available in late 2021 and 2022.

The US carriers will switch off their old 2G and 3G networks in the next few years, but 4G will likely be around for a while, coexisting with 5G. It is predicted that 5G will reach 45 percent of the world's users by 2024. 🇺🇸



## James P. Renda, Esq.

69 Delaware Ave., Suite 1006, Buffalo, NY 14202 | (716) 885-4335 | [JRenda@rendalaw.com](mailto:JRenda@rendalaw.com)

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