YRH Newsletter

May 2020

5G Deployments: Threat or Opportunity?

In light of the recent unfortunate events concerning cellular tower fires and various reports in the news and/or on social media concerning the fears related to the deployment of 5G technology, we decided to add our voice to the discussion and shed some light these issues.

The 5G designates the next generation standard for mobile communication. It primarily applies to cellphones, but can also be used by all sorts of devices that are connected to the wireless network, such as autonomous cars, smart thermostats, etc. 5G will follow and, eventually replace, the 3G and 4G telecom networks currently in use, just as they have replaced the preceding generations. This evolution allowed us to go from simple calls on our portable phones, to the transmission of text messages, to the data and video streaming we see today. Thus 5G will in turn allow us one day to surpass these advancements.

Many questions arise when a new technology is introduced and 5G is no exception. Some of the main concerns associated with the deployment of 5G technologies that are often reported in the media include:

- There are links between 5G networks and the COVID-19 outbreak;
- There are no studies on exposure to these frequencies;
- 5G will add antennas everywhere and will increase RF exposure;
- Do we really need 5G?
- With 5G, everything will be connected (IoT – Internet of Things), a further invasion of our privacy.

The following pages will answer these questions and provide some clarifications.

SOLUTIONS

YRH provides multiple solutions to help you with your telecommunication projects. Our knowledge, experience, and flexibility ensure that we are practical and creative at the same time.

ENGINEERING

Our professional engineering team will design an efficient solution adjusted to your needs, whether they are a simple project, a complex system or a network.

CONSULTING

Our broad experience and reputation in multiple telecommunication areas gives our engineering team the knowledge to help you in your telecommunication projects. We value our independence from service providers and manufacturer to provide the best evaluations and solutions.

5G Deployment: Threat or Opportunity?

There are links between 5G networks and the COVID-19 pandemic: TRUE or FALSE?

First, we shall address the most recent of these fears because of the global COVID-19 pandemic that we are experiencing. Many journalists specializing in hoaxes and fake news have disproved and debunked these claims. The same is true for many national and international (ICNIRP) public health organizations. We refer you to their work before adding, in conclusion, that there are no reasons to believe that COVID-19 pandemic is connected in any way to 5G.

Answer: False

For the rest of the discussion, we will use some terms that deserve a short explanation: Operating power and frequency are often mentioned when talking about radio waves or electromagnetic waves. Frequency represents the number of oscillations per second of the wave while power represents the amount of energy radiated by an antenna. We can make an analogy using sound waves: the frequency represents the tone (the low frequencies are bass sounds while high frequencies are high pitch) while power is similar to volume. This is, of course, only a simple analogy.

There are no studies on exposure to these frequencies: TRUE or FALSE?

A concern often expressed about 5G is that the health effects of the frequencies used by these technologies are not well known. Here are some facts: 5G technologies will use two frequency groups: Initial deployment will use frequencies between 600 MHz and 5.8 GHz. Cellular antennas currently in operation (3G and 4G) already use similar frequencies, ranging from 600 MHz to 3.5 GHz. So, 5G will bring only a slight change to the frequencies used. In addition, frequencies around 600/700 MHz have already been used for decades in broadcasting. Do you remember seeing channels 52 to 69 on an old TV? These channels used the 600/700 MHz frequencies that have since been reassigned to cellphone use!

The second phase of 5G deployment in Canada is planned around 2023-2025. This phase will include the use of significantly higher frequencies, ranging from 6 GHz to 80 GHz. Although rarely used in consumer and mobility applications, these frequencies are nevertheless already in use. The microwave links which transmit telephone calls and data over long and short distances use these frequencies. Satellite links as well as aviation and maritime navigation systems have also used these frequencies for many years. Thus, these frequencies are not in any way new. Furthermore, existing applications that use these frequencies (such as navigation) do so at significantly higher power levels than those that will be used for 5G applications.

We can therefore say that the frequencies used by 5G are neither new nor unstudied. Furthermore, the Canadian reference in terms of exposure to radio frequencies (Safety Code 6, under the authority of Health Canada) applies to all of these frequencies and well beyond, from 3 kHz to 300 GHz. This standard, based on international scientific studies spanning many years, is already in force and will apply to all new applications.

Answer: FALSE and in addition, studies are ongoing worldwide.

5G Deployments: Threat or Opportunity?

5G will add antennas everywhere and will increase RF exposure: TRUE or FALSE?

Many people are concerned about the increase in the number of antennas following the introduction of 5G technologies and believe that this will lead to a large increase in our personal exposure to electromagnetic waves. Although it is correct to say that the implementation of 5G will eventually lead to the use of numerous antennas, it is necessary to add some details: The antennas that will be found “on every street corner”, as the saying goes, will be small and barely visible. They will be quite different from the cellular antennas currently in use that are the size of a refrigerator door. The 5G antennas will be the size of a shoe box. In addition, these future antennas will use much less power than those used by current technologies.

One of the goals of positioning 5G antennas in this way is to ensure uniform coverage and using as little power as possible. We could use another analogy here: the existing cellular antennas are like an intense light that illuminates a whole neighbourhood, with well-light areas and other locations in shadows. The 5G antennas would instead be deployed much like street lights, providing less intense but more evenly distributed lighting, with few areas of shade. Other features of 5G technologies also ensure that the personal exposure of users will not increase: the rate of transmission of the information will be much faster so the duration of the exposure required to download a document will be greatly reduced. Many other aspects of what constitute 5G are planned with the aim of minimizing the power and duration of transmissions while improving user experience and limiting network latency for advanced applications. The total effect of these techniques will ensure that the personal exposure of users will not change drastically.

Answer: TRUE - there will be an increase of small antennas but FALSE - the RF exposure of users will not change significantly.

5G Deployment: Threat or Opportunity?

Do we really need 5G: YES or NO?

We sometimes wonder about the need to implement these new technologies. Do we really need to download a movie in seconds? Is it urgent that Facebook, Twitter or TikTok be accessible everywhere, at all times and without waiting? Do we really need to buy new devices that will use these technologies? It is tempting to answer these questions with a resounding 'no', but it would be at the risk of ignoring many of the benefits that 5G technologies will bring.

One of the advantages of 5G is the very high transmission speed and the very short response time (latency) that it will allow. These characteristics are necessary for the implementation of applications such as autonomous vehicles or telemedicine. With the aging population, autonomous vehicles will be of great importance to ensure the autonomy of seniors: people who lose their driver's licence due to age-related medical problems could maintain their autonomy and keep in touch with their networks of support. In fact, the automotive industry is already preparing for this by putting in place standards that will allow for the integration of these technologies.

In addition, without necessarily considering autonomous vehicles, 5G could have positive environmental impacts on transportation, by optimizing trips in real time to save time and fuel, especially for freight delivery fleets. Telemedicine is another application that will benefit from the implementation of 5G. Medical specialists residing in large urban centres could serve rural and remote areas thanks to the network speed that this new telecommunications standard will allow. The same applies to tele-education and working remotely.

We are in a very special situation these days related to the COVID-19 pandemic. Many of us isolate ourselves at home and we all depend on telecommunication networks to work but also to shop, stay fit and entertain ourselves. For some people this is only temporary. But this situation will allow employers to see that people who are normally limited in their travel, such as people with disabilities, can be an integral part of the workforce. Remote accessibility applications will be faster, more robust and more accessible with 5G technologies, especially where wired networks cannot be deployed.

The COVID-19 pandemic is just the latest example of health, humanitarian and economic crises that we face. Fast, reliable and high-capacity communications networks are essential to ensure an adequate response to these challenges, both today and in the future.

Answer: YES – 5G is the continuity of existing cellular networks (3G/4G) and complementary telecommunications technologies, such as Wi-Fi, satellites, FTTH and Bluetooth.

5G Deployment: Threat or Opportunity?

With 5G everything will be connected (IoT – Internet of Things) allowing for invasion of our privacy: TRUE or FALSE?

When everything from our car to our dryer will be connected to 5G telecommunications networks, will security of our personal data be at risk? These fears are not unique to 5G; they already exist. In short, it is not 5G technology that causes this important problem. The problem stems from the different applications or software that we already authorize with manufacturers, operators, etc. All issues of privacy versus society, be it the government or corporations are crucial concerns that stem from well before the deployment of 5G.

Answer: FALSE – it is not 5G technology but applications and software already in place on your computers, laptops and connected devices that are subject to these legitimate privacy concerns.

Overall, we are convinced that there are more advantages than drawbacks to the gradual deployment of 5G technology. Like any new technology, there are natural fears and anxieties associated with it. But the best way to deal with these concerns is by making our decisions based on the most recent, complete and reliable scientific knowledge. In addition, we will need to ensure that these technologies are gradually deployed in compliance with safety standards and existing laws and regulations.

For more information or questions on the subject, do not hesitate to contact our experts listed above or at telecom@yrh.com or 514-934-3024.

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Yves R. Hamel et Associés Inc., your consultant-experts in telecommunications, broadcasting and mobile networks since 1967.

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