

# ARE “SMART CITIES” HEALTHY CITIES?

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**5G WIRELESS NETWORKS, SELF-DRIVING CARS, AND THE INTERNET OF THINGS MIGHT BRING US ENHANCED CONNECTIVITY AND CONVENIENCE (IN SOME SENSE), BUT RECENT SCIENTIFIC RESEARCH RAISES HEALTH CONCERNS ABOUT THESE ELEMENTS OF THE EMERGING “SMART CITIES.”**

The technological revolution has bestowed upon us many benefits, including unprecedented access to information, heightened convenience, global interconnectedness, and economic opportunity. The next evolutionary step in wireless technology is the so-called “smart city.” The city of the not-too-distant future will include 5G wireless antennas on most utility poles, “Internet of Things” sensors attached to every object with quantifiable functions, and self-driving vehicles circling our city blocks.

We are told that this exponential rise in wireless technology will usher us into a more sustainable future of ease and abundance. However, cracks are appearing in this utopian technological vision. At the very time that the “smart city” is being rolled out, our best scientific evidence is showing how detrimental wireless technology can be to our health. Our technological path forward must incorporate this new information if we are to maintain a sustainable, healthy society into the future.

We’re going to examine the ingredients that comprise a “smart city,” as well as what the most current science says about the health effects of wireless technology—in hopes of identifying key strategies for using technology in healthier ways.

### **WHAT IS 5G WIRELESS?**

5G stands for “fifth generation” wireless technology. Our smartphones currently run on 3G and 4G technology, which utilizes a limited range of the microwave spectrum. 5G will greatly expand the range of microwave spectrum used.

The low end of the spectrum (700 MHz) will allow for greater penetration of buildings than existing technology. The higher end of 5G frequencies will range from 28 to 73 GHz. These high frequencies do not travel as far or penetrate buildings as easily as lower frequencies; however, much more data can be encoded on the wave. This will enable 5G devices to download an entire movie in a few seconds, and will allow companies like AT&T to deliver HBO programs wirelessly, rather than via cables.

The key requirement for the 5G rollout is the ability of wireless companies to put cellular antennas on nearly every utility and light pole in our neighborhoods. It is estimated that the 5G network will require each of the four major wireless carriers to install one million new antennas.<sup>1</sup> This implies that, in cities, microwave antennas will pervade the landscape—probably lying within 20 feet of every bedroom window.

### **THE “INTERNET OF THINGS”**

The lower frequencies of the 5G spectrum will allow wireless companies to reach any “smart” device sporting a wireless antenna. This will potentially allow cities to better control utility equipment and infrastructure, which can certainly benefit society. However, what happens when this technology comes into our homes? Wireless versions of electric toothbrushes, coffeemakers, toasters, thermostats, and security systems are all common fixtures within the new “smart home.” It may seem like a convenience to have your coffeemaker turn on once your smartphone senses that you have woken up. However, a “smart home” is also, by definition, filled with high-level microwave radiation. Is the convenience of having your coffee ready when you wake up really worth the risks of exposure to microwave radiation? →

## SELF-DRIVING VEHICLES

A highly visible part of the smart city is the self-driving car. In the coming years, people in cities will be whisked around by artificial intelligence on wheels while they sit back and watch videos on their 5G phones. This may sound utopian and may reduce human-initiated accidents, but it also possesses a major downside: self-driving cars require eight different types of wireless technology to operate. These categories include Lidar, radar, DSRC (dedicated, short-range communication), infrared sensors, visual cameras, WiFi, Bluetooth, and 4G/5G cellular connections. Self-driving cars are meant to make our streets safer; however, they will also bathe passengers and nearby residents in microwave radiation. Unfortunately, the health repercussions of using this technology may outweigh any benefits we derive from self-driving cars and other elements of the “smart city.”

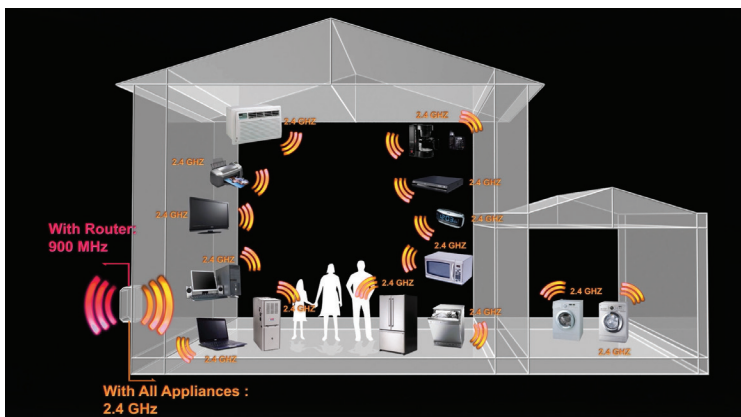
## THE HEALTH EFFECTS OF MICROWAVE TECHNOLOGIES

Our society operates under the belief that wireless technology is safe unless it is powerful enough to heat the human body. This principle forms the basis of the Federal Communications Commission’s safety guidelines for wireless technology. However, there are thousands of studies demonstrating serious biological effects at exposures below what it takes to heat body tissue. These “non-thermal” effects have been disregarded for decades, in part because of the inconvenience they would represent for a wireless-addicted society.

However, the preliminary results of a landmark United States NTP (National Toxicology Program) study, released in May 2016, demand that we remove our heads from the sand.<sup>2</sup> The \$25-million NTP study is the biggest and most carefully designed study on cellphone radiation ever completed. Its objective was to determine, once and for all, whether cellphone radiation is safe. Significantly, it has demonstrated that cellphone radiation can cause brain cancer and DNA-level damage in rats.<sup>3</sup> The results were so surprising and alarming to scientists that they released the results early to warn the public, so that we could start making changes in how we use technology.

In the coming years, there must be a change in public policy (like we once saw with tobacco, asbestos, and DDT, respectively) if we are to achieve a healthy society. To this end, the American Cancer Society has said that the NTP results mark “a paradigm shift in our understanding of radiation and cancer risk.”<sup>4</sup> We are also starting to see medical organizations around the world, such as the American Academy of Pediatrics (AAP), issue guidelines for reduced wireless exposure for children.<sup>5,6</sup>

Furthermore, while cancer risk is important, it does not even constitute the primary risk associated with electromagnetic-field (EMF) pollution. There is abundant, high-quality research indicating that it initiates sperm damage and negative effects on immune, endocrine, cardiac, and nervous-system function.<sup>7,8</sup> This is why many people are now experiencing acute symptoms, such as headaches, tinnitus, and sleep disturbances, when over-exposed to wireless technology. While the mainstream medical community is not yet acknowledging this problem, many medical doctors are now well aware that people are being affected and are advising their patients to avoid excessive EMF pollution. Often, this is a primary solution to help their patients heal.



## SOLUTIONS YOU CAN IMPLEMENT TODAY

When it comes to navigating the “smart city,” your best option is to opt out of wireless technology as much as you can. Don’t install the accoutrements of a “smart home,” and avoid self-driving cars. If a wireless communications company wants to install a new cellular antenna in front of your home, work with your neighbors to protest such placement. This could persuade the company to choose a different location, away from your home. This will buy you more time as society gradually awakens to this issue and moves toward other solutions, such as fiber optics.

Other key strategies that will help you use technology in a healthier way include the following:

**Be aware of how you use your smartphone.** Owner’s manuals now instruct users to never put the phone within half to 1 inch of the body. Never hold the phone to your head, in a bra strap, or in your pants pocket, unless it is turned off or on airplane mode. For calls, use speaker-phone mode or a headset.

**Avoid using Bluetooth headsets.** They are powerful microwave transmitters that work right next to your brain. The phone is also radiating in your pocket, near your reproductive organs. When at the gym, use an iPod mini with a wired headset, or download Paleo podcasts to your phone and turn it to Airplane Mode so that it is not transmitting when on your body.

**Transition to using wired technology at home.** Ethernet cables and a wired router are the healthiest option for Internet and TV use. I use a combination of fiber optics and Ethernet in my home. If you do use Wi-Fi, put the router on a timer so that it turns off automatically at night. At night, it is critical to reduce or eliminate exposure to blue light and EMF pollution.

**Eliminate cordless phones and wireless baby monitors from your home.** Wired landline phones are the healthiest option for long calls. A wired baby monitor will give you all the functionality of the less-safe wireless version.

**Request an analog meter from your utility company.** Many states now offer the healthier analog option. In California, nearly 100,000 families have switched back to analog meters because of the health risks and privacy issues associated with wireless smart-meters.

**Measure your home for EMF pollution.** With a few measurement devices, or the help of a professional consultant, you can learn what is happening within your home and make a few changes that will greatly reduce your EMF exposure.

The coming years will likely see a rapid expansion in wireless technology with the development of “smart cities.” At the same time, scientific research increasingly shows how harmful this technology can be to our health, and society will ultimately have to negotiate a balance between the benefits and risks of wireless technology. With the above solutions, you can take simple actions today that will help you and your family use technology in a much healthier way.