



Connecticut is ready for 5G. Are you? Should you be?

BY NAIDEN STOYANOV

This summer, Connecticut Governor Lamont joined lawmakers and industry leaders in a ceremony held in Stamford to sign a bill adopting legislation to accelerate the deployment of 5G technology in the state. The new law establishes a process to set 5G infrastructure on state property and for municipalities interested in adopting the technology where utility or light poles are not available.

The new 5G wireless network, is many times faster than anything we've had until today, and is coming soon to our neighborhood. It promises to usher in a whole new era of innovation and connectedness. Your car, your house, your fridge, even your clothing can one day soon be a part of this Internet of Things or IoT. But what exactly is 5G and is it worth the cost and hype? And how safe

is it for humans and all other living things?

WHY 5G?

As more devices are getting connected, the current wireless network is quickly running out of space. And we are just at the beginning of the era of the IoT when just about everything around us will be connected online. With the current

wireless capabilities as more “things” get on board speeds will get slower and availability will get scarcer. This is where 5G comes into play. The new network will offer lightning-fast speeds with decreased latency (the time it takes for one device to talk to another). It's like opening a whole new 100-lane highway for cars that drive a few times the speed of sound where only a single-lane local road for regular vehicles existed before.

In another example – with 4G you might be able to download a high definition movie in a few minutes, but on 5G the same flick would be yours in just a few seconds.

This will be a game-changer for many industries. Pretty much any business that uses a computer and the Internet should benefit from the new bandwidth. 5G promises to accelerate the development and adoption of driverless cars, augmented reality, the broadband market and many other new technologies.

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ON A NEW WAVELENGTH

So why is 5G so much better than what we currently use? There are many reasons 5G can carry a lot more data and performs better. While the whole thing is pretty complicated to explain in a short article, one of main differences is that it uses a higher range of radio frequencies than the current 4G and everything that was before it. But higher frequencies have a much harder time penetrating walls and obstacles and cover much less ground than the lower band that the current system uses. That means that towers have to be installed much, much closer together if the network is to have adequate and useful coverage.

Estimates on how many more new towers have to be installed vary wildly with some suggesting that a new cell will be needed for every 50 houses while others insist that every third house will require their own tower. The truth might be somewhere in between, depending on the density of each town, trees, terrain as well as other factors that might come into play.

However, 5G towers are so small that they can be installed on utility polls, street lights, sides of buildings and other similar places (hence the new law facilitating their installation, signed by Gov. Lamont). Soon these boxes will be everywhere. Consider this: currently there are over 300,000 towers in the United States. While no one can be certain, some estimates claim that there will be a need for five times the number of towers that the current 4G network uses in order to cover the country with 5G adequately ($5 \times 300,000 = 1,500,000$). And then each provider will need their own device... (currently providers often share towers). So this number could grow much higher.

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HEALTH

If you had even the slightest concern about cell phone radiation, whether from your phone or from the network towers around us, you might be asking yourself how safe is the new 5G and the exponentially larger amount of towers that will be all around and closer to us than ever?

There are two issues that some environmental and health advocates raise about the new network—the sheer number and density of towers and the safety of the much higher frequencies of the waves for 5G transmissions.

Today's 4G uses channels between 750MHz and 2.1GHz where 5G goes higher and can reach 86GHz. But is that higher frequency more dangerous to humans? Scientists are still working on establishing the safety of non-ionizing radiation (like the one emitted by wireless devices). There have been studies showing increased incidences of cancer in test animals exposed to large doses of such radiation. Other studies allege a link between RF (radio frequency) radiation exposure and higher number of cancers and other adverse health effects in humans. Yet a definitive link between cell phone network coverage, use and exposure and adverse health effects has not been established and accepted yet.

Health advocates argue that the increased frequencies carry a much larger risk to humans as our bodies will be hit by radio oscillations many more times than the current network. However, 5G network supporters say that since the new waves can't penetrate objects very well, the

new radiation will be more readily stopped by our skin, hence it will be rendered harmless to our organs.

The jury is still out on this one, and if history is to repeat itself, the real impact the new technology has on our bodies, if any, won't be established definitively for years, decades or never.

PROGRESS

Meanwhile, the world presses on with the installation of the new infrastructure and Connecticut is trying to make sure it doesn't miss out on the boom. And understandably so.

Trying to be at the forefront of 5G is the right move for our economy as the 5G revolution promises to greatly benefit businesses and consumers alike.

Yet, some health advocates worry that the new technology's safety has not been robustly tested for its potential effects on our health and the environment. They are also concerned that the new high frequency microwaves are too close to the already known to be harmful ultra high frequency microwaves.

But as history has shown, for better or worse, industrial and technological progress promising economic boom, whether harmful or not, is all but impossible to stop, unless these health effects are obvious and dramatic.

And so far, mainstream science and relevant authorities insist that the new technology is safe.

AMAZING POSSIBILITIES

The new 5G network, once fully up and running, will change everything. Some liken it to the invention of the Internet. It will change the way we consume network services entirely. Everything will be connected. Like it or not, 5G is coming and whoever gets there first will have a running start into an economic mother lode of opportunity and Connecticut is so far on track to get there soon. ■

