

5G technology: Fueling the next stage of mobility

Article

The possibilities for innovation are limitless. Are you ready?

As the latest generation of wireless technology, 5G promises to drastically change the way business is conducted. It will unleash new capabilities, crack open new markets and experiences and connect people and devices like never before.

What makes 5G a technological powerhouse

Verizon 5G Ultra Wideband's ultrafast speeds and increased bandwidth will make possible things like intelligent video; smart cities; virtual and augmented reality; advanced, low-latency robotics; self-driving cars; immersive collaboration experiences; and so much more. Plus it will build the sandbox where developers can dream up a host of yet-to-be-created experiences. 5G's features will also make large data-file transfers frictionless and help many modern technologies, like Ultra HD video conferencing, reach their full potential through higher bandwidth and a lower network latency.

Superfast speeds and ultrawide broadband

Today's mobile apps and services work best on a high-speed, high-bandwidth and low-latency wireless network. And if history teaches us anything, it is that the apps and services of tomorrow will require even faster speeds and lower latency. Verizon 5G Ultra Wideband will increase the transmission capabilities and potential of mobility, with speeds much faster than 4G. It will feature multi-gigabit-per-second data transmission feeds and less than 10 milliseconds of latency, so apps become more responsive and run blazingly fast.

Improved communications and collaboration

The advanced features found in 5G will generate new business possibilities and previously unthought-of experiences. 5G will allow for enhanced mobile broadband offerings that, in turn, will enable immersive and highly interactive communications and collaboration tools. Tools like video telepresence and

conferencing that can help business teams deliver better-quality work and increase productivity.

Ultra HD video streaming will also be possible, which can help to enhance business and employee communication, mobile conferencing, mobile learning and similar use cases.

Empowering mission-critical services

Many solutions on the horizon will require split-second timing and exact control to function effectively, making mission-critical connections a must. Verizon 5G Ultra Wideband's high reliability and near real-time speeds will make it perfectly suited to connect services like these:



Autonomous vehicles and robotics

5G's lower latency will mean less lag time for information to travel to and from a vehicle's or robot's sensors, enabling quicker decisions and corrections.



Industrial and manufacturing automation

These industries rely on precise timing and delicate control in making products; 5G's near real-time latency will keep the assembly lines running like they should.



Haptic internet applications

5G's ultralow lag time will help make haptic applications more responsive, improving how they simulate the sense of touch, which can be used in simulations, robotics, robotic surgery, telemedicine, deep-space exploration, video gaming and more.



Augmented reality/virtual reality

The large data flows enabled by 5G will allow organizations to create new, immersive experiences that can enhance education and learning, improve the capabilities of smart cities and intelligent video solutions, and be used to augment reality for firefighters, police officers or technicians entering dangerous or unstable areas.

At Verizon, we're first with 5G.

Verizon was the first in the world to deliver a commercial 5G service (5G Home), initially offering service in Houston, Indianapolis, Los Angeles and Sacramento.

Customers in Chicago and Minneapolis were the first in the world to harness the power of 5G Ultra Wideband with 5G-capable devices. We've continued to expand into more cities across the nation. Visit [verizonwireless.com/5g/coverage-map/](https://www.verizonwireless.com/5g/coverage-map/) for an always-current list of our 5G Ultra Wideband cities.

Businesses and consumers in these cities can choose from the widest selection of 5G devices available on any 5G network, and could see speeds of up to 1 Gbps.

Following is a list of our other 5G firsts:

- First video call placed over a precommercial 5G connection on a prototype 5G device at the 2018 Super Bowl with Samsung
- First 5G New Radio (NR) data transmission in a lab with Nokia and Qualcomm in February 2018
- First two-way data transmission of 3GPP 5G NR and the first use of multicarrier aggregation to boost the signal into Gbps range—outdoors—with Nokia in June 2018
- First transmission of a 5G NR signal to a receiver in a moving vehicle with Nokia in August 2018
- First data transmission on a commercially deployed 5G NR network in Washington, DC, in September 2018 with Nokia
- First data transmission over commercial 5G NR network equipment to a prototype smartphone device in Minneapolis with Ericsson and Qualcomm in September 2018

Verizon is also working with local innovators to grow the 5G ecosystem at our 5G Labs in New York City; Washington, DC; Cambridge; Palo Alto; and Los Angeles.

A company's evolution to 5G won't happen overnight, but there are steps you can take now to prepare. Like building out your business ecosystem to take full advantage of all the capabilities offered by 4G LTE Advanced.

Beamforming

Beamforming is a technology used by cellular base stations to handle the high speeds and traffic of 5G. It refers to the process of concentrating transmit power to a small area using multiple antennas to increase coverage and capacity. This process identifies the most efficient route for data delivery to a specific user, while reducing interference for nearby users at the same time.

Carrier aggregation

This feature allows wireless network operators to combine different bands of radio frequencies together, so mobile devices can gain the benefits of more bandwidth, resulting in higher speeds.

Gigabit LTE

An advanced form of 4G LTE, Gigabit LTE delivers speeds up to 1 gigabit per second.

MIoT

Massive Internet of Things (MIoT) is the billions of devices and machines that require constant connectivity, including those deployed in the most remote of locations. They infrequently transmit their data to the cloud, yet they still need the cost-efficient, large-area coverage enabled by 5G and they offer long-lasting battery life and low energy consumption.

MIMO

Multiple input, multiple output (MIMO) is the practice of adding more antennas to mobile devices and cell towers to increase capacity.

QAM/256-QAM

Quadrature Amplitude Modulation (QAM) is a modulation technique used to transmit data and information. QAM uses waves to represent specific binary numbers, increasing the amount of information transmitted. The higher the wave number, the more data capacity it has, hence 256-QAM supports more information transfer per bit than 16-QAM.

Small cells

Small cells are simply smaller cell sites of multiple sizes used to increase the density of cellular networks, so their coverage and capacity can be more finely engineered.

Learn more:

Learn more by contacting your business specialist.

Glossary of 5G-related terms

5G New Radio (NR)

The standards for 5G wireless communications as set by Third Generation Partnership Project (3GPP).