5G Glossary

3GPP (3rd Generation Partnership Project) A project that unites seven telecommunications standard development organizations and develops global specifications for advanced mobile communications, including the global 5G standard. 3GPP standards are disseminated as "Releases" and each release incorporates hundreds or even thousands of individual specifications.

5G NR (New Radio) The global standard for 5G (fifth generation) mobile network, developed by 3GPP.

AR (Augmented Reality) An interactive technology that superimposes an image onto a user's view of the real world and enhances it with sound, touch and/or smell.

Bandwidth The capacity of telecommunications and internet networks to convey data and signals. 5G will allow for an exponentially larger bandwidth, which will enable a much higher rate of data transfer.

Base Station A fixed point of communication that connects mobile devices to the cellular network. 5G base stations will include new technologies like beamforming massive multiple-input, multiple-output (MIMO) antennas.

Beamforming A wireless technique that utilizes advanced antenna technologies to focus a wireless signal in a specific direction, rather than broadcasting to a wide area, like a spotlight rather than a floodlight.

Capacity The maximum data volume a network can support at one time in a given geography. 5G is designed to support a 100x increase in traffic capacity to support the increasing demand for data and huge number of new use cases and devices.

Device Any user gadget that uses radio waves to communicate can be considered a wireless device, such as a phone, a laptop, smart watch or connected car. 5G will enable wireless connectivity in a broader range of devices and applications than previous generations.

Edge Processing Processing data "at the edge" means that the computation and analysis of information in an application happens closer to the user, in devices or nearby network equipment instead of traveling to the cloud. Edge processing enables faster responsiveness, more privacy, resiliency and in many cases lower cost.

Encryption The process of converting information or plain data into scrambled data to make it unreadable for unauthorized access.

IoT (Internet of Things) An extension of internet connectivity into physical devices, machines, and everyday objects. IoT allows these inanimate objects to communicate with each other over the internet. They can also be monitored and controlled remotely. 5G networks will greatly expand the capabilities and applications of IoT.

Latency The term used to describe communication delays within a network. Latency is the time it takes to get a response to information sent — also known as "lag time." 5G will reduce latency to levels that are virtually imperceptible (the length of a camera flash).

Massive MIMO (Multiple-Input Multiple-Output) Allows simultaneous sending and receiving of more than one data signal on the same channel through the use of multiple antennas. Massive MIMO systems offer significant advantages such as allowing network capacity to be significantly multiplied.

mmWave (Millimeter Waves) High frequency waves capable of handling more data with greater speed. Millimeter waves are broadcast at frequencies between 30 and 300 gigahertz (GHz). They are called millimeter waves because they vary in length from 1 to 10mm, compared to the radio waves that serve previous generations of mobile devices, which measure tens of centimeters in length. This portion of spectrum has never been used for mobile devices before, but due to recent technological breakthroughs, mmWave is an important solution for 5G.

Radio Frequency The portion of the electromagnetic spectrum used for telecommunications. In 5G, there are three main frequency ranges (measured in hertz, which denotes the number of cycles per second):

+ Low-band (below 1 GHz) – can travel long distances and penetrate deep into buildings but its limited availability results in slower data speeds

+ Mid-band (1 - 6 GHz) – Offers more limited coverage compared to low-bands but allows for faster speeds

+ High-band (above 24 GHz), commonly referred to as millimeter wave – travels shorter distances but allows for extremely high data speeds

Scalability This is the ability of a network to adapt to changes in the demand, to save energy when activity is low or maintain the quality of service at peak connection levels.

Small Cell Portable miniature base stations that require minimal power to operate and can be placed throughout cities to form a dense network that enables transmission of signals around obstacles. Like a relay team handing off a baton, small cells help route data to users at any location without interruptions.

Spectrum The electromagnetic continuum on which radio waves travel to send information from one place to another. 5G will utilize portions of Spectrum that have never before been used for cellular communications.

Standards A set of technical specifications that define the rules for communication and interoperability among networking equipment and devices. Standards help in creating and maintaining open markets and allow different vendors to compete on the basis of the quality of their products while being compatible with existing market products. 5G standards are adopted via a consensus-based process to ensure that the best technological solutions available are included. As new technologies are developed, 5G standards are updated and disseminated as "Releases." Each release incorporates hundreds or even thousands of individual features and enhancements that serve as a playbook for all 5G products (devices, components, infrastructure, etc).

Telemedicine The utilization of high-speed, high-capacity connections to facilitate medical diagnosis, treatment and training from a remote location.

V2V Vehicle-to-Vehicle communication allows automobiles to "talk" to each other by exchanging data via a wireless network.

V2X Vehicle-to-Everything communications will allow cars to communicate, not only to each other, but also exchange information with sensors in stoplights, signs, bus stops, and even roads. Data from these sensors may also be exchanged with smart devices to help predict and reroute traffic.

XR (Extended Reality) Extended Reality represents a continuum of real-and-virtual combined environments and human-machine interactions generated by computer technology and wearables. XR is an umbrella term that includes augmented reality (AR), mixed reality (MR), and virtual reality (VR).