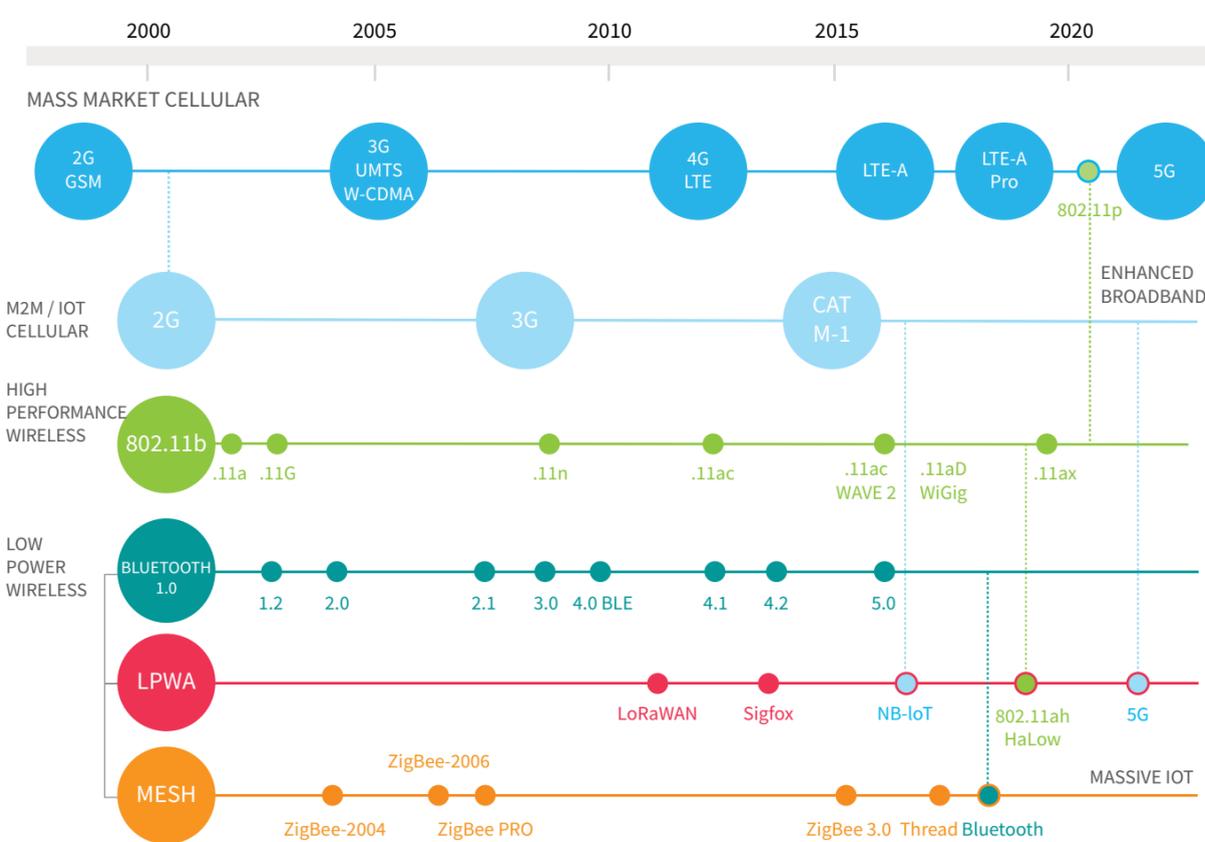


The connectivity landscape on the path to full 5G

Connectivity, the foundation of digital communication, continues to evolve. Development will pivot around varied and changing requirements for ubiquitous and deep coverage, low latency, high bandwidth, and long battery life. LTE-M and NB-IoT will be rapidly deployed and will enable use cases that could not be supported by legacy cellular technologies.

A host of other iterations of LTE, from Cat 1 to Gigabit LTE, will serve consumer, enterprise, and IoT use cases before and after 5G is commercially launched.

5G to enter a crowded market



The IoT connectivity landscape is complex and fragmented, with numerous technologies overlapping in function and addressable market. Nevertheless, consolidation of standards going forward will increasingly simplify this landscape. **We explore six of those standards below.**

5G

The 5G hype continues to grow, with the first deployments set to launch in 2018. Early 5G activity will first focus on Fixed Wireless Access then mobile broadband use cases. The path to full 5G adoption, and the transformative role of 5G-enabled massive IoT and mission-critical services, is more complicated.

More than **1 billion** global subscriptions, excluding IoT connections, will be in place by 2023.



More than **320 million** LTE-M and NB-IoT connections will be in place by 2020.

LPWA

5G deployments will continue to leverage current LTE-based LPWA technology well into the next decade, as LTE-M and NB-IoT—technologies specially designed for the IoT—already provide excellent costs, battery life, and in-building penetration profiles for traditional sensor-based IoT applications.

Fiber

The need to deploy fixed infrastructure with fiber for 5G backhaul is expected to boost opportunities for extending fiber network availability. If current predictions for network densification hold true, the need for fiber will be significant.

In 2018 there will be **7.02 million** macrocell fiber connections as the installed base, up from **4.29 million** in 2017.



By 2020, there will be approximately **1.6 million** connected public safety devices on private LTE networks globally.

Private LTE

Enabling the use of robust, 3GPP standard communications technology for private LTE deployment is extremely beneficial for industrial customers, such as oil and gas companies, which possess facilities outside the range of traditional public network cellular footprints. Private LTE is yet another networking concept that will be leveraged in the near term and then incorporated over the longer term into 5G NR.

Mobile broadband

Mobile broadband and fixed wireless access (FWA) services will be a focus for operators in the short term. FWA services can be deployed to extend coverage beyond the fixed fiber network, but as 4G LTE services progress further, operators may find it difficult to find new use cases that could justify or drive demand for services not already addressed by existing technologies. LTE networks are already good enough for many consumer mobile use cases.

In the US, more and more cities are going above **20 Mbps**, which is great for consumers. Within all **125 cities** recently tested for mobile performance, consumers are staying connected—a boon for reliability.



15 to 20 companies, including OneWeb and SpaceX, plan to launch large LEO constellations in the next few years.

LEO satellites

The renaissance in Low Earth Orbit (LEO) satellites deployment is clear and on the rise. Many of these LEO constellations are focusing on Earth imaging, as this application provides a huge opportunity to service providers.

