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# 5G Is the Key to Future American Competitiveness

The telecom industry's race for 5G is one of the most intense and consequential technological contests of our time. What will it take to win?

As the global race to develop and deploy 5G telecommunications networks heats up, the urgency for American investment in its digital infrastructure is rising in tandem.

Rapid and large-scale deployment of 5G would not only help the United States maintain its economic and technological edge globally, but it would also offer an opportunity to realize three other national objectives. First, it would support the transition of the economy to the Fourth Industrial Revolution ushered in by dramatic technology innovations. Second, it would promote a stronger, more innovative, and more competitive business landscape, which in turn would support sustainable and high-paying jobs. Finally, it would provide increased access, benefiting both local communities and the private sector in under-served areas.

The stakes are extraordinarily high. The first country to achieve large-scale, reliable 5G coverage stands to reap significant economic gains—starting with higher technological innovation, elevated economic growth, and strengthened national competitiveness. The returns will be far larger than upfront investments.

## **5G: A World of Change**

A new era of the digital economy was unleashed as wireless networks evolved from voice-only 2G, to voice and text, and then to the latest Internet-enabled 4G LTE technology. Once fully deployed, 5G will be similarly transformative, given its ability to support massive Machine to Machine (M2M) communications through greater bandwidth, such as between cellphones, sensors, “smart” machinery and appliances, and other Internet of Things (IoT) devices. In addition to IoT, 5G will support a range of new and future applications in each of the other next-generation technologies at the core of the [future of production](#)—artificial intelligence, robotics, additive manufacturing, and augmented and virtual reality (AR/VR).

There is no doubt that 5G will have a significant impact on American consumers. One obvious way will be from performance improvement, such as faster video streaming and real-time gaming thanks to the reduced latency provided by 5G networks.

A.T. Kearney's recent [Health@250](#) report highlighted how mobile health solutions from wearables, IoT devices, and related technologies will take advantage of 5G for improved data collection and real-time monitoring, while other advances such as remote surgery will also become possible.

The power and convenience of 5G may even contribute to the next wave of "cord cutting" in fixed services—particularly given 5G's potential as a way to provide high-speed connectivity to customers currently underserved by existing fixed broadband infrastructure.

5G will also have a significant impact on the B2B market. The entire ICT industry—from chipmakers to telecom companies to hardware and software manufacturers—is building out this technology with B2B customers and "things" top of mind. Businesses will have countless devices talking to one another as well as to the cloud, streaming massive amounts of data. While IoT devices are already proliferating rapidly due to the connectivity offered by today's LTE networks, 5G will further enhance connectivity for these devices due to network slicing, improved spectrum efficiency, and better power management.

As a result, businesses will be able to better manage fields and factories with much lower latency than is possible with current WLAN networks, track goods in real time along their supply chains, and follow products from the retail shelf into the home.

Data sharing will also be multidirectional. For instance, a truck tire will simultaneously collect data on wear and tear, road conditions, temperature, and air pressure for both the vehicle owner and the tire manufacturer, providing crucial inputs for maintenance schedules and future product development.

Finally, take "[smart cities](#)," which promise better traffic management, improved car safety, and route optimization. What makes them "smart" is the ability of their systems to share large amounts of data instantly between other cars, road sensors, traffic lights, and other devices.

And while there is always a trade-off between supporting M2M and latency in any network, 5G will see improvements in both, leading to significantly improved performance across the spectrum of 5G use cases. According to Rob Thies, general partner at World Innovation Lab Ventures, "5G is as big as the transition from dial-up to DSL, and will change the world just as much."

[Qualcomm estimates](#) that the global 5G value chain will be \$3.5 trillion by 2035, which is larger than the entire mobile value chain today. Add to that another \$12.3 trillion in "5G-enabled" growth. For the United States, the projected economic impact is no less staggering. The telecommunications industry association CTIA estimates that 5G will create three million new jobs, on top of a wireless industry that already supports 4.7 million workers. It will also generate an estimated \$500 billion in economic growth—including 5G-enabled innovation by startups and major companies alike that will add new economic value.

The efficiency and speed with which 5G delivers these economic and social benefits, however, will depend on the scale, timeline, and geographic scope of the investments made by the mobile operators, as well as how friendly government policies are to 5G adoption, including wireless spectrum auction processes. Importantly, 5G opens up enormous new blocks of spectrum, making it most cost-effective to serve the relentless rise in traffic on networks.

## **What Are the Incentives for 5G?**

A key incentive for making such an investment is the potential for new revenue streams, accomplished in part by working more closely with B2B companies. For example, given the significant

B2B market for 5G capabilities, it is likely that changes will occur in the cost structures for what are known as “over-the-top,” or OTT, services such as current video content providers and future AR/VR services and autonomous vehicle operators, as well as their relationships with telecom companies. For example, Tesla is [partnering with Intel](#) to bring 5G connectivity to its vehicles. Further, Ericsson estimates the potential market size for industry digitalization that telecoms could tap into will be nearly \$620 billion by 2026. We therefore expect to see considerable experimentation and innovation in this space in the coming years.

B2C will also provide incentives for investment in 5G, particularly as mobile use continues to rise globally. As reinforced by the Mary Meeker’s [2018 Internet trends report](#), mobile Internet usage remains the key driver of digital media consumption. Global average smartphone costs continue to decline, mobile payments are increasingly standard, and the mobile experience is becoming further ingrained in people’s daily lives. With 5G, more services can be brought to mobile, further amplifying the scope for innovation.

## The Global 5G Race

Major economies around the world—particularly those in Asia—are working aggressively to develop 5G networks. The Chinese government, for example, is [actively pushing](#) for 5G amid a broader effort to strengthen its digital economy, including through its “Made in China 2025” initiative. South Korea used the occasion of the 2018 Olympics to demonstrate its 5G prowess. A [drone connected to a 5G network](#) even carried the Olympic torch. And Japan is expected to use the 2020 Olympic Games to do the same. Australia, the United Kingdom, and others will also test 5G networks in the coming months and years.

CTIA forecasts that US telecoms will invest \$275 billion in 5G technology, including fiber-optic cables, small cells, and other 5G network infrastructure. All the major US telecoms are planning 5G trials in 2018 and 2019 across dozens of cities—with 2020 as the consensus tipping point for 5G across major urban centers—fostered by strong competition among them to be the first to deliver 5G to customers. Indeed, a key stated goal of the [proposed merger between T-Mobile and Sprint](#) is to utilize their combined assets to become the first nationwide 5G carrier. Such a development would push other telecoms to accelerate their 5G rollouts in order to compete in the marketplace, improving mobile access for consumers and businesses throughout the country. For their part, [AT&T](#) and [Verizon](#) have both discussed how 5G is creating new opportunities for all the top US telecoms, with each one implementing a different strategy to develop and deploy its capabilities. At the same time, the rollout of 5G will allow telecoms to retire some of the capacity dedicated to 2G and 3G networks, enabling important cost savings and reinvestment of resources, as well.

US telecoms may also use the deployment of 5G to capture a previously untapped and underserved customer base—rural America. In this effort, public and private sector interests would be aligned. The US Federal Communications Commission has identified 5G investment as integral to [closing the digital divide](#) that still persists today. Opportunities may therefore emerge for public-private partnerships between telecoms and governments at the local, state, and federal levels to roll out 5G coverage, particularly to underserved areas. This is important, as concerns regarding the social impact of technology are growing, including whether the 4IR will reduce or exacerbate inequality. Such questions will in large part determine the long-term outlook for the United States, as explored in our [America@250](#) effort to assess the outlook for the country on its 250th anniversary in 2026 and beyond.

## What Will It Take to Win the 5G Race?

The future center of global technological change will shift as a result of who wins the 5G race. To be sure, not every country is a perfect candidate for aggressive 5G investments given variations in market size, level of technological penetration, the size of the rural market, and other factors. Additionally, questions remain regarding the business case for large-scale 5G investments, as the average consumer [may yet be unwilling to pay a premium for low latency or high-speed connections](#).

But national competitiveness, particularly for the world's major economies, will increasingly be determined by the level of 4IR technological adoption and innovation, which in turn will depend on the quality of national 5G wireless networks. Winning the 5G race requires ensuring that coverage is both broad and deep across a given market. Only then will the impacts of massive infrastructure investments, job creation, and broader economic growth be realized.

To upgrade its digital infrastructure quickly and efficiently, the United States must ensure that the proper incentives are in place to foster massive investments by—and healthy competition among—the country's telecom companies. These companies also need the space to innovate and experiment with new business models in collaboration with the wide variety of industries expected to leverage 5G. America's future competitiveness depends on it.

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This piece is part of a series focused on the development and rollout of 5G technology.

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