

Policy Brief: 5G Primer

5G, that is, the fifth iterative advancement of mobile communication, is coming, and when it does, it will transform the way we interact with the Internet.¹ Currently, 5G wireless broadband networks are being deployed in test markets around the country. When it finally makes it to the mainstream, it will wildly accelerate Internet speeds. It will also have the capacity to accommodate billions of more devices, and will help blast the tech world into the future.

How does 5G work?

Wireless 5G transponders are attached to fixed infrastructure throughout the desired service area. These transponders are connected to the fiber-optic “backhaul,” which connects the transponders to the service network. The transponders then convert the broadband to a wireless signal and push the signal out to any devices in range.

The transponders are strategically placed on existing utility poles, other existing infrastructure, or mini-towers built for the purpose of 5G deployment. Each transponder has a limited coverage area, ranging from 1,000 to 3,000 feet.² The short range would seemingly limit 5G’s potential, but as discussed below, we can’t think of 5G in the same context we think about other wired and wireless broadband services.

How is 5G different?

Let’s get specific. The first generation of mobile communication technology let you make cell phone calls. Second generation, or 2G, let you send text and picture messages. Finally, 3G made iPhones and other smart devices operable in a real way. And 4G, with LTE, is where we are today.³ While 5G basically does the same things as 4G, it does them much faster.⁴

How much faster? At best, current 4G smartphones operate at about 100 Mbps (megabits per second), but more realistically, they operate at about 10 – 20 Mbps.⁵ Early tests of 5G, however, have reached speeds of 3.77 Gbps (gigabits per second) with a projected operating speed of up to 10 Gbps, that’s 10,000 Mbps.⁶ That’s huge.



¹ Kate Cox, What the Heck is 5G Anyway, and Why Does it Matter?, <https://consumerist.com/2016/07/13/what-the-heck-is-5g-anyway-and-why-does-it-matter/>, (February 22, 2017).

² Bill Coleman, Blandin Foundation, “5G Wireless as Rural Solution: Not Any Time Soon.” (February 6, 2017).

³ Ibid.

⁴ Ibid.

⁵ Ibid.

⁶ Ibid; Michael Nunez, What is 5G and How Will It Make My Life Better?, <https://gizmodo.com/what-is-5g-and-how-will-it-make-my-life-better-1760847799>, (February 24, 2016).

What can 5G speeds do that 4G cannot?

At these speeds, an HD movie that would take 7 minutes to download with 4G, could be downloaded in a matter of seconds with 5G.⁷ Plus, 5G has an ultra-low latency rate. Latency is the time it takes one device to send a packet of data to another device.⁸ So, low latency is a great thing. Today, 4G has a latency rate of about 50 milliseconds.⁹ Compare this to 5G's one.¹⁰ One millisecond. 5G's ultra-low latency is important, not just to send emails faster, but it will advance the quality of streaming and real-time communication apps and will help make driverless cars a reality.¹¹ When you're driving on the freeway at 70 miles per hour, you don't want a communication delay between your car and the car in front of you.

On top of that, the "Internet of Things" are on the rise. Smart home appliances, door locks, security cameras, cars, dog collars, etc.¹² Estimates suggest that there will be almost 21 billion devices connected to the Internet by 2020, an incredible leap from the 6.4 billion connected worldwide today.¹³ Fortunately, 5G will have the capacity to handle it, and then some.

5G is the next step in our constant evolution forward. We hear so much about the technologies of the future, but few of these advancements are possible without a robust 5G network in place. First 5G, then the future.



The Alliance for Innovation and Infrastructure (Aii) is an independent, non-profit alliance focusing on infrastructure innovation through awareness and education.

⁷ Bonnie Cha, What is 5G, and What Does It Mean for Consumers?, <https://www.recode.net/2015/3/13/11560156/what-is-5g-and-what-does-it-mean-for-consumers>, March 13, 2015.

⁸ Ibid; Sarah Thomas, 5G: What Is It & Why Does It Matter?, <http://www.lightreading.com/mobile/5g/5gwhat-is-it-and-why-does-it-matter/a/d-id/714803>, (April 1, 2015).

⁹ Ibid; Sarah Thomas, 5G: What Is It & Why Does It Matter?, <http://www.lightreading.com/mobile/5g/5gwhat-is-it-and-why-does-it-matter/a/d-id/714803>, (April 1, 2015).

¹⁰ See Cha, *supra*; see Thomas *supra*.

¹¹ See Cha, *supra*.

¹² See Nunez, *supra*.

¹³ Ibid.