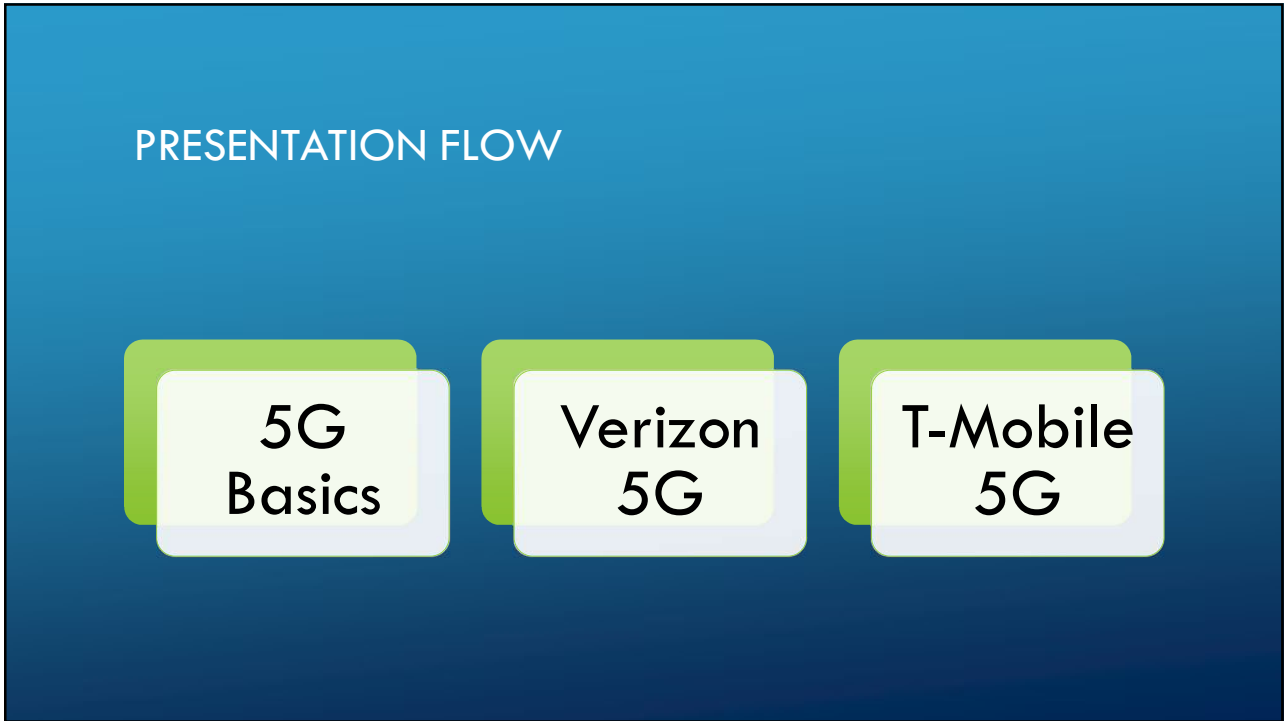




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5G, DECODED

- <https://youtu.be/01Nc1ORlosg>

3

TECHNICALLY SPEAKING – WHAT IS 5G

Fifth-generation wireless (5G) is the latest iteration of cellular technology, engineered to greatly increase the speed and responsiveness of wireless networks. With 5G, data transmitted over wireless broadband connections can travel at multigigabit speeds, with potential peak speeds as high as 20 gigabits per second (Gbps) by some estimates. These speeds exceed wireline network speeds and offer latency of below 5 milliseconds (ms) or lower, which is useful for applications that require real-time feedback. 5G will enable a sharp increase in the amount of data transmitted over wireless systems due to more available bandwidth and advanced antenna technology.

*TechTarget

4

HOW DOES 5G WORK?

Wireless networks are composed of cell sites divided into sectors that send data through radio waves. Fourth-generation (4G) Long-Term Evolution (LTE) wireless technology provides the foundation for 5G. Unlike 4G, which requires large, high-power cell towers to radiate signals over longer distances, 5G wireless signals are transmitted through large numbers of small cell stations located in places like light poles or building roofs. The use of multiple small cells is necessary because the millimeter wave (mmWave) spectrum-- the band of spectrum between 30 and 300 gigahertz (Ghz) that 5G relies on to generate high speeds -- can only travel over short distances and is subject to interference from weather and physical obstacles, like buildings or trees.

*TechTarget

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PRACTICALLY ROLLING OUT 5G

- An approach for creating a national 5G network is to use a combination of high-, medium- and low-band frequencies. MmWave may be used in densely populated areas, while low- and midband nodes may be used in less dense areas. The low-band frequencies can travel longer and through different objects. One low-band 5G node can stay connected to a 5G-enabled device for up to hundreds of square miles. This means that an implementation of all three bands will give blanket coverage while providing the fastest speeds in the most highly trafficked areas.

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5G PERFORMANCE

5G download speeds can currently reach upwards of 1,000 megabits per second (Mbps) or even up to 2.1 Gbps. To visualize this, a user could start a YouTube video in 1080p quality on a 5G device without it buffering. Downloading an app or an episode of a Netflix show, which may currently take up to a few minutes, can be completed in just a few seconds. Wirelessly streaming video in 4K also becomes much more viable. If on mmWave, these examples would currently need to be within an unobstructed city block away from a 5G node; if not, the download speed would drop back down to 4G.

Low band can stay locked at 5G over longer distances, and even though the overall speed of low-band 5G may be slower than mmWave, low band should still be faster than what would be considered a good 4G connection. Low-band 5G download speeds may be up to 30 to 250 Mbps. Low-band 5G is more likely to be available for more rural locations. Midband 5G download speeds may reach up to 100 to 900 Mbps, and it is likely to be used in major metro areas.

*TechTarget

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VERIZON 5G – ULTRAWIDEBAND VS NATIONWIDE

Verizon offers two types of 5G service: 5G Ultra Wideband and 5G Nationwide.

5G Ultra Wideband is Verizon's fastest 5G. Compared to typical 4G speeds, it runs up to 10x as fast, and responds quicker.

5G Nationwide runs alongside 4G LTE, and delivers a similar experience to Verizon's 4G LTE network to provide a widely available 5G network that offers convenience and reliability.

Only our top Unlimited plans provide access to both 5G Ultra Wideband and 5G Nationwide.

All other plans provide access to 5G Nationwide only.

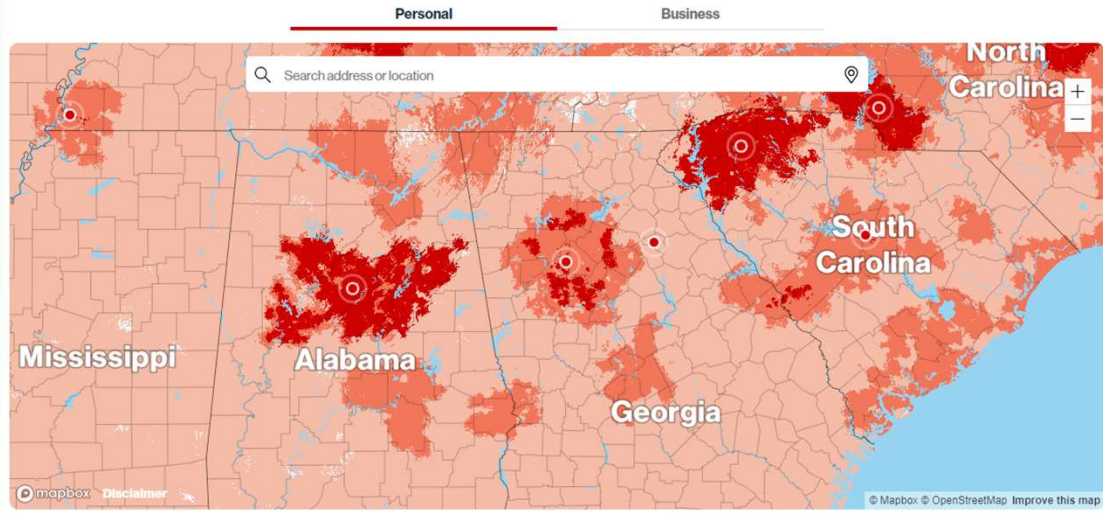
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VERIZON HOME INTERNET SERVICE

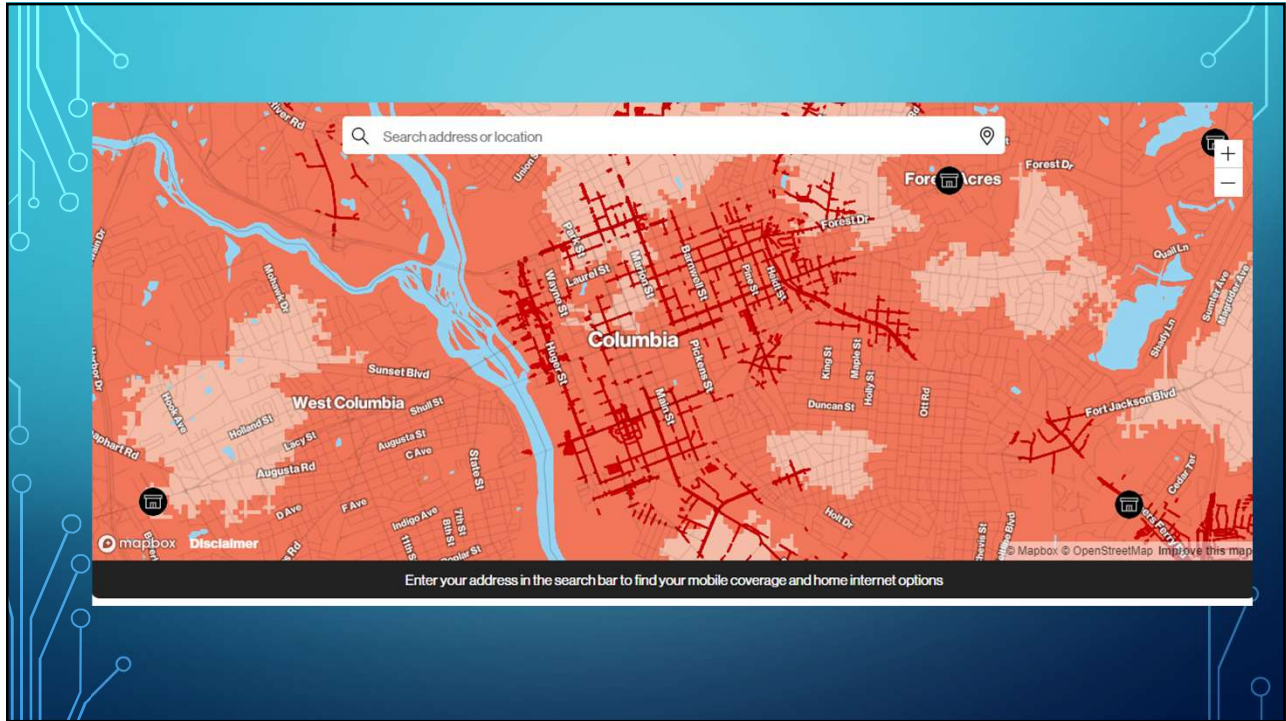
- 5G Home Internet is the first internet powered by 5G Ultra Wideband. Rather than via underground fiber-optic cable, 5G Home provides internet via a 5G antenna outside your home, delivering a fast wireless connection right through your wall or window. With very high capacity and very low lag-time, you can smoothly stream video, video chat, and game. It's conveniently priced with no annual contracts, data caps, and all taxes and fees are included.

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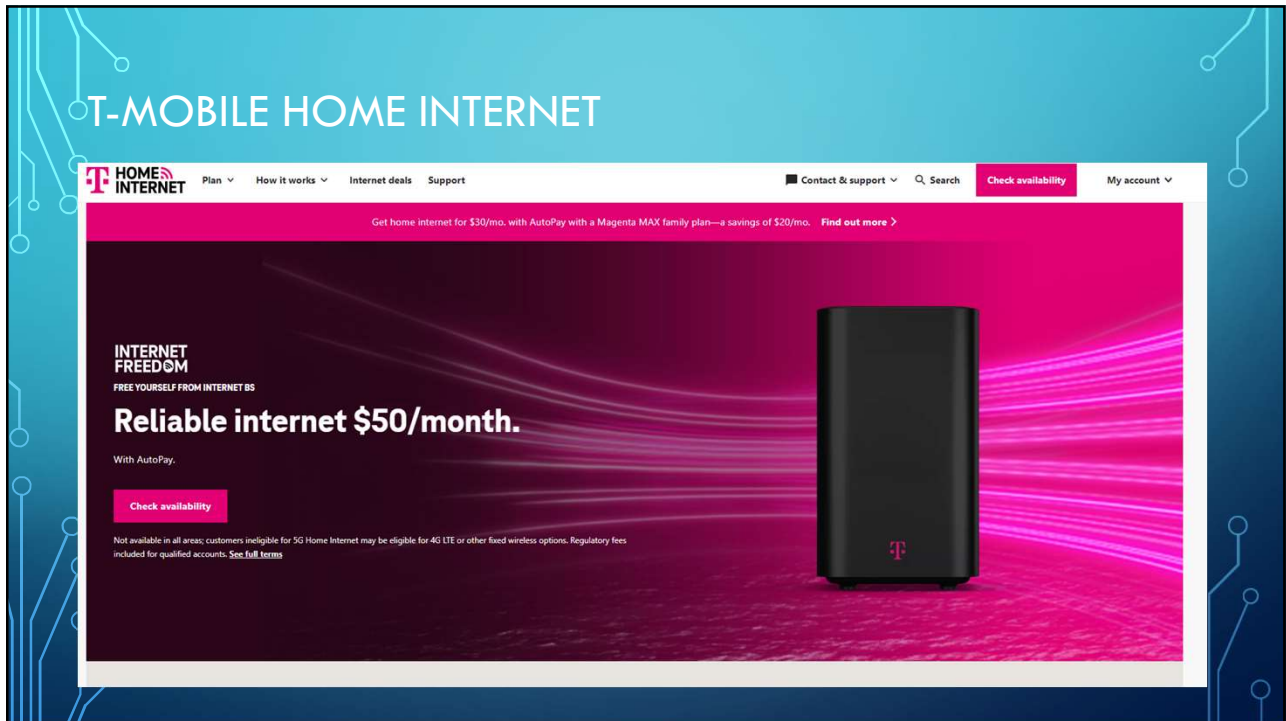
Explore Verizon 5G and 4G LTE network coverage in your area.



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WHAT IS T-MOBILE HOME INTERNET

T-Mobile Home Internet is an expanding offering from T-Mobile, available to more than 30 million households nationwide.

It's fast, affordable home internet service that lets you do it all for just \$50 a month with AutoPay, taxes and fees included for qualified accounts – a flat price, no annual contract and no data caps.

T-Mobile Home Internet service connects to the same great 4G LTE or 5G network T-Mobile smartphones run on, depending on signal availability at your eligible address.

You receive service through a 5G Gateway device (which combines the capabilities of a router and a modem), the Gateway device then converts the 5G signal to Wi-Fi, and provides a Wi-Fi signal accessible by all the devices in your home.

Easy, self-installation – set up in as little as 15 minutes.

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COMMENTS

- 5G Marketing is ahead of 5G Reality
- There is 5G in the area leveraging 4G LTE transmission infrastructure with speeds reaching 200 megabits in some spots locally
- 5G Home Internet may be an acceptable and cost effective option for “low bandwidth homes”
- Ultrawide or mmWave 5G is not likely to arrive here for 5 or more years and will hit high density housing first.

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Q&A

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FURTHER READING

- <https://www.techtarget.com/searchnetworking/definition/5G>
- <https://edition.cnn.com/interactive/2020/03/business/what-is-5g/>

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