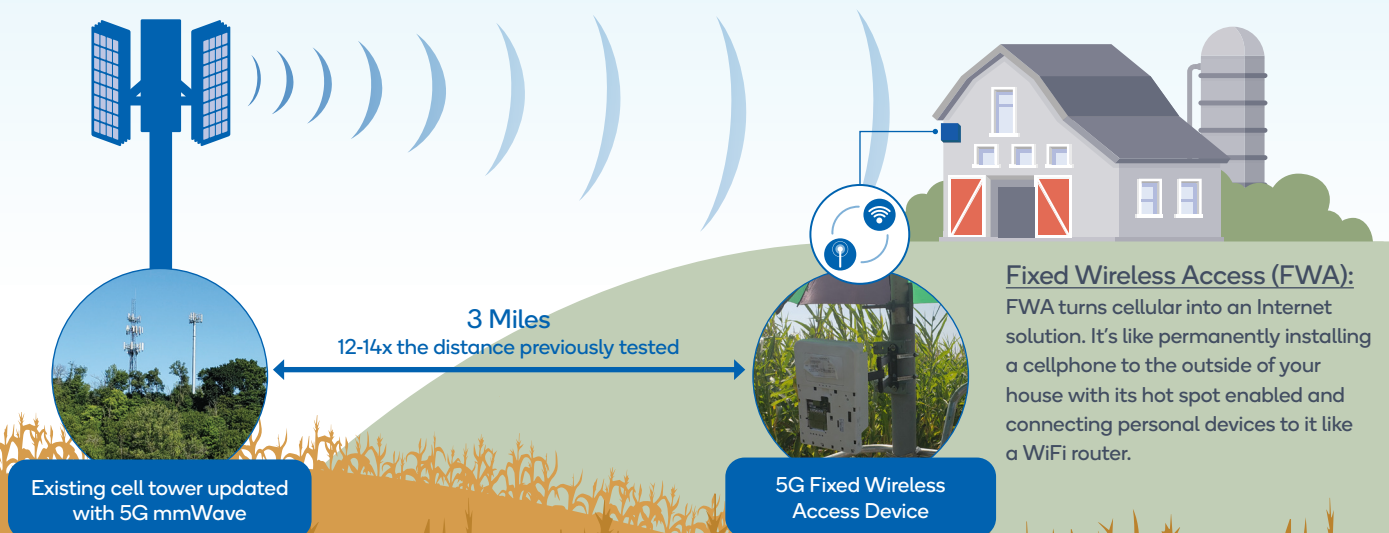


5G mmWave brings **streaming speeds to rural America** in a cost-effective way



The first 5G millimeter wave data call in the United States was achieved on a commercial network in Wisconsin.



5G mmWave Test Key Milestones

Speed: >200 Mbps

Distance: 3+ miles*

- Offers a cost-effective way to bring 5G speeds to households and businesses in urban, suburban and rural communities
- Solves "last mile" challenges in rural areas by providing a way to bring coverage to residents outside city limits
- Allows for no data caps and additional services like connected cars, sensors and even streets to connect to the network without any interruption to a user's home connectivity
- Speeds significantly increased closer to the cell tower (1.8 Gbps at a distance of 0.18 miles or 3 football fields from the tower)

*Speed and distance continues to increase with every test.

The first extended-range 5G NR millimeter wave (mmWave) data call in the United States was achieved on a commercial network in Janesville, Wisconsin, over a distance of more than 3 miles with speeds of greater than 200 megabits per second (Mbps).

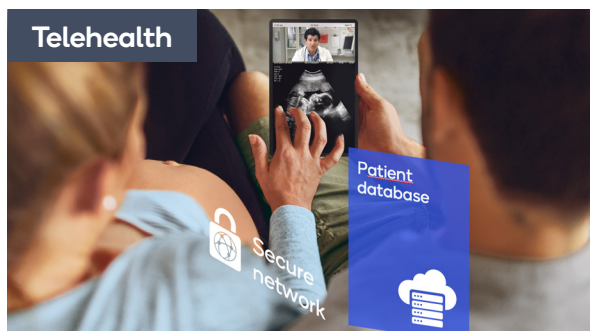
The distance redefines the perception of 5G mmWave spectrum as an urban — or high-density-only deployment technology. In addition, 200 Mbps is enough speed for high-data-intensive

requirements like streaming 4K video to multiple devices. It's also enough data to connect remotely to a doctor, stream a lesson plan and for simpler things like surfing the web and checking email. This cost-effective solution will help to close the connectivity divide and ensure that access extends to everyone regardless of their location or economic status. It also builds resiliency into the ecosystem and can connect those most impacted by COVID-19.

Harnessing the 5G network will unlock unprecedented capacity and speed



With 5G Fixed Wireless Access (FWA), farmers can connect to their crops and livestock with real-time data processing capabilities. 5G speeds and capacity will help farmers improve production yields and so much more.



Access to telemedicine and telehealth via a reliable broadband like 5G FWA is vital to safely manage health from home, especially for high-risk populations like the elderly who can't risk leaving the house.

This breakthrough gives communications service providers a cost-effective way to expand their coverage and deliver fiber-like Internet speeds wirelessly over mmWave. 5G FWA can address some of the “last mile” challenges in rural areas just outside the city limits to residents that were previously not covered. The current 4G FWA does not offer the same capacity and speed needed for today's data intensive use. 5G will not only help close the connectivity gap for those who don't have access, but it will also provide a new connectivity option for residents living within the coverage areas.

The table below outlines the current connectivity options in Janesville, Wisconsin:

| Summary of Internet Providers in Janesville, WI* | | |
|--|--------------------------|---|
| Provider | Type | Max Speed |
| ★ Residential or Business | 5G Fixed Wireless Access | 200 Mbps |
| Residential Provider 1 | 4G Fixed Wireless | 15 Mbps (13x slower than 5G mmWave) |
| Residential Provider 2 | DSL | 100 Mbps |
| Residential Provider 3 | Cable | 940 Mbps (Max capacity: 10 people = 94 Mbps per person or less) |
| Residential Provider 4 | 4G Fixed Wireless | 10 Mbps |
| Residential Provider 5 | 4G Fixed Wireless | 30 Mbps |
| Residential Provider 6 | DSL | 4.0 Mbps |
| Residential Provider 7 | DSL | 10 Mbps |
| Residential Provider 8 | Satellite | 100 Mbps (Cost for 30 Mbps is \$150 on satellite) |
| Residential Provider 9 | Satellite | 25 Mbps (Cost for 25 Mbps is \$50 on satellite) |
| Business Provider 1 | 4G Fixed Wireless | 15 Mbps (13x slower than 5G mmWave) |
| Business Provider 2 | 4G Fixed Wireless | 30 Mbps (6.6x slower than 5GmmWave) |
| Business Provider 3 | DSL | 10 Mbps |
| Business Provider 4 | Cable | 940 Mbps (Max capacity: 10 people = 94 Mbps per person or less) |
| Business Provider 5 | 4G Fixed Wireless | 10 Mbps |

* Source: <https://broadbandnow.com>

¹ While satellite covers 100% of the territory, it is cost prohibitive: 30Mbps costs \$150 and ultimately data rates are slow