



May 2021

Federal Funds, Satellite Rivals Could Expedite Rural 5G Plans

Key Points:

- Over the last several quarters, 5G coverage has increased with T-Mobile leading the pack in urban and rural America.
- However, rural 5G speeds are quite a bit slower than speeds offered in urban markets. This is largely a function of the low-band spectrum being used in rural America.
- Tier one operators see 5G fixed wireless as a strategic growth driver as they compete for lucrative broadband customers in urban and suburban markets. Widespread availability of high-speed 5G fixed wireless in rural America is likely a ways off.
- The potential windfall of federal broadband support represents new opportunities for rural operators by expanding existing networks and/or signing managed services contracts with non-traditional broadband organizations.
- While true high-speed 5G in rural America will lag urban and suburban coverage, the emergence of LEO satellites as a legitimate broadband alternative could expedite tier one operators' plans.



Jeff Johnston
*Lead Economist,
Communications*



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Introduction

Many things have changed since the first 5G phone was launched in the U.S. about two years ago. Sprint and T-Mobile merged with commitments to build out 5G coverage in rural America. Verizon spent an unprecedented amount of money at the C-band auction to support its 5G network build plans. Dish Network is now in the early stages of building a greenfield nationwide 5G network, and the cable operators are planning to build regional 5G networks.

The industry is also on the cusp of receiving billions in federal support to help subsidize the cost of building broadband networks in rural America. And while most of these dollars will go towards building fixed-line broadband networks, 5G will still play an important role.

In this report we look at the current state of 5G, when rural America can expect true high-speed 5G, and what opportunities exist for rural operators as 5G is deployed.

Current State of 5G

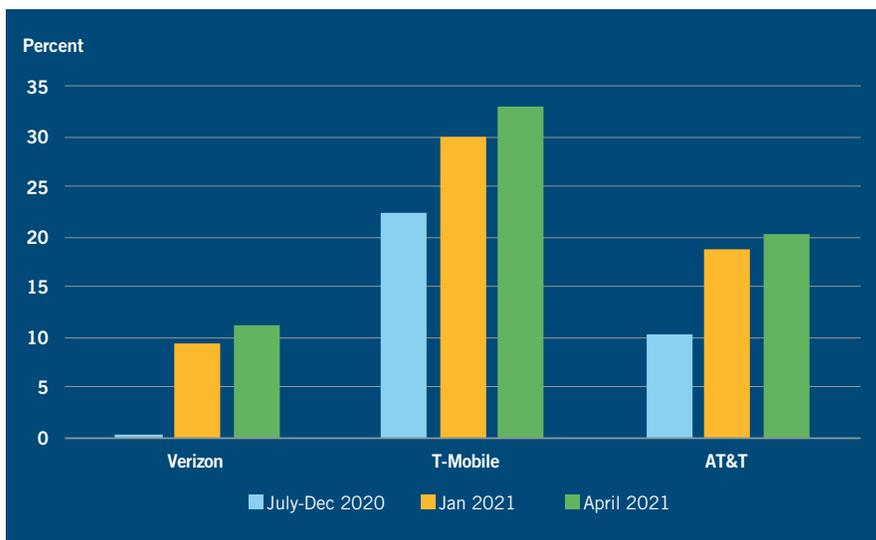
U.S. 5G coverage has come a long way over the last several months. According to Opensignal, which specializes in mobile network analytics, 5G coverage is up across the board (*Exhibit 1*). T-Mobile saw the largest increase in availability, largely due to its use of low-band 600 MHz spectrum. It also delivered the fastest download speed, with its network clocking in at 71.3 Mbps in April, up from 58.1 Mbps in January and 28.2 Mbps in July 2020 (*Exhibit 2*). T-Mobile's network speed is clearly benefiting from the mid-band 2.5 GHz spectrum it acquired from Sprint.

Over the next few quarters, Verizon and AT&T will be busy laying the groundwork to deploy their C-band spectrum, which they recently acquired in the FCC's a record-smashing \$81 billion auction. Once this spectrum is cleared we expect both carriers, Verizon in particular, to deploy it aggressively as it is the linchpin to offering "nationwide" 5G high-speed coverage.

In rural America, 5G coverage appears to be improving, but the increase in speed is underwhelming. According to Opensignal, T-Mobile's standalone 5G coverage in rural America increased 8.8 percentage points between August 2020 and January 2021, while urban standalone coverage increased 4.6 percentage points. Because T-Mobile is using 600 MHz spectrum in rural America, it's able to cost-effectively blanket large coverage areas with 5G. However, download speeds are sacrificed, topping out at 30 Mbps. And although these speeds are slightly above the FCC's

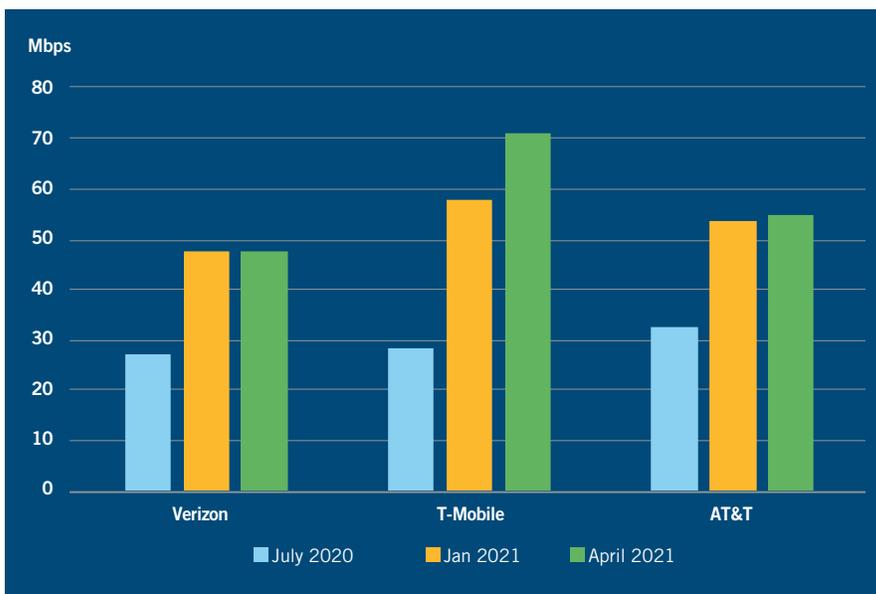
definition of broadband, over time they could decline unless T-Mobile adds enough network capacity to keep up with demand. That will depend on a lot of factors including competition, churn, and capital budgeting considerations.

EXHIBIT 1: 5G Availability



Source: Opensignal

EXHIBIT 2: Download Speeds



Source: Opensignal



5G Fixed Wireless

Fixed wireless over 5G is starting to garner more attention as the national carriers – and even the cable operators – talk up their plans to deploy it. The wireless operators' core business is saturated and as a result they are looking for new growth opportunities. And what better opportunity than the residential broadband market where margins are high and opportunities to bundle mobile and fixed wireless services could be an attractive value proposition.

Verizon now offers its 5G Home Internet service (marketing name for its 5G fixed wireless service) in 71 cities and is providing up to \$500 to cover early termination fees for customers who leave their current internet provider and switch to 5G Home Internet. We think that over time, Verizon could turn its attention to rural America as it hunts for new opportunities. However, it's unclear when and how aggressively Verizon would implement such a strategy, as there is plenty of new business to go after in urban and suburban markets.

T-Mobile recently announced its home internet service, emphasizing the underserved and unserved in rural and small towns. The network utilizes LTE and 5G spectrum bands and the carrier said that more than 30 million homes are eligible today, with approximately 10 million of those homes in small towns or rural areas. T-Mobile also announced a new program called Hometown Experts, which will support approximately 2,500 small

towns with service-related issues. T-Mobile claims that all eligible households can expect to see average download speeds of 50 Mbps, but of course, wireless network speeds vary based on signal strength, time of day, and other factors.

While it's great to see T-Mobile's rural market focus, we don't expect AT&T or Verizon adopt a similar playbook anytime soon. Recall that as a condition of T-Mobile acquiring Sprint, T-Mobile agreed to cover 97% of the U.S. population with 5G within three years of their deal's close, which gives T-Mobile two years to make good on its commitment.

Lastly, we think Low Earth Orbiting (LEO) satellite networks could change how aggressively tier one operators build 5G rural coverage. LEO broadband networks are generating quite a buzz and are initially targeting rural markets. Proponents believe they are an ideal solution to bridge the digital divide, but at this point it's far from certain they will succeed. However, if LEO broadband operators are able to prove – during their initial rural market launches – that their network is a viable broadband alternative to fixed-line or fixed wireless, then they might go on the offensive and enter the lucrative urban and suburban markets. This potential threat could cause the incumbent tier one operators (both cable and wireless) to go on the defensive by expediting their rural network build plans. This would serve to reduce the market opportunity and create more competition for LEO operators with the goal of limiting their competitive threat.

Government Funding

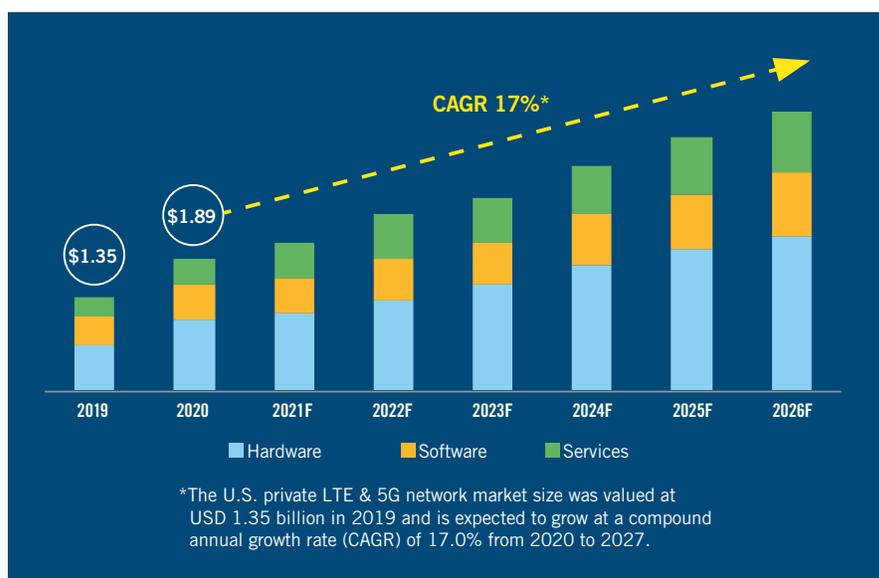
The Biden administration's \$2.3 trillion infrastructure proposal includes \$100 billion for broadband builds in unserved and underserved areas. Coupled with existing federal broadband programs, funding would provide more than \$120 billion to build new networks – which would go a long way to bridging the digital divide.

The proposal prioritizes spending for government-run or nonprofit networks. As the White House explains, those providers have “less pressure to turn profits” and

“a commitment to serving entire communities.” Republicans have since released a counter proposal which cuts the total number to \$568 billion, and the broadband component to \$65 billion. At this point it’s unclear how much money will be available and who will be eligible, but it’s clear there is bipartisan support to bridge the digital divide.

We expect fixed-line broadband networks to garner the largest share of financial support, however, 5G networks will play a role, especially in high-cost, low-population density areas.

EXHIBIT 3: North American Private 5G Market Forecast (in \$Billions)



Source: Grand View Research

Rural 5G Opportunities

For rural America to reap the benefits of high-speed 5G, the networks must operate on mid-band spectrum. The FCC recently made a large swath of mid-band spectrum in the Citizens Broadband Radio Service (CBRS) band available for unlicensed use and offered small chunks of licenses that rural operators could afford. The CBRS band and the rural expansion from national operators (T-Mobile being the most active) offer interesting opportunities.

Private Networks and Managed Services

As the technical and cost barriers fall, a growing number of large enterprises are implementing private wireless networks (*Exhibit 3*). These custom-built wireless networks can deliver many of the benefits of automation, efficiency, and security that 5G promises. For rural operators, designing, building and running private 5G networks could be a new business opportunity.

For example, 5G private networks could help a rancher monitor herd health in real time, enabling them to proactively administer medical care. Or a manufacturing plant could increase its level of automation with 5G sensors communicating with each other and over a server in real time. We note that John Deere is already moving in this direction with plans to improve operating efficiencies by deploying a high-speed, in-plant CBRS network.

The aforementioned CBRS band and access to lower-cost carrier grade equipment enables small operators to gain exposure to 5G market opportunities in a low risk way.

If President Biden’s infrastructure plan successfully prioritizes government-run and nonprofit organizations, managed services should be on the table as an opportunity for rural communication operators. The aforementioned organizations have limited experience in designing, building, and running a telecom network. The high-cost nature of the unserved and underserved areas means that fixed wireless 5G will play a role in some of the markets. Rural communication operators are well-positioned to help these grant-receiving organizations design and build 5G networks. They could also leverage their network infrastructure and experience to manage the day-to-day operations of the network.

Fiber and Towers

Tier one operators building out the edge of their 5G networks into rural America will need access to fiber and towers. It makes sense for tier one operators to partner with rural operators who have such infrastructure already in place versus building their own towers/fiber networks. This is especially true in the current environment where access to equipment and labor is very tight.

Conclusion

5G coverage has greatly expanded over the last several quarters and we expect Verizon to use its C-band deployments starting later this year to really step on the gas. However, these C-band builds will likely be limited to urban and suburban markets for the foreseeable future. T-Mobile seems to be achieving its 5G rural fixed wireless coverage commitments, but the speeds are significantly slower than what is being offered in urban markets. The potential windfall of government broadband support represents opportunities for rural wireless operators by either expanding their existing networks, or via managed services should government-run and/or non-profits receive priority funding. Longer-term, rural operators are well-positioned to offer fiber backhaul and tower leasing services to expanded 5G networks in rural America. However, if national operators view LEO satellite networks as a legitimate broadband alternative, it could expedite their 5G plans. ■

References

- <https://www.tomsguide.com/us/att-5g-network,news-29855.html>
- <https://www.tomsguide.com/news/verizon-5g-coverage-map-plans-phones-and-home-internet>
- <https://www.opensignal.com/reports/2021/01/usa/mobile-network-experience-5g>
- <https://www.fiercewireless.com/operators/t-mobile-launches-commercial-5g-home-internet>
- <https://www.t-mobile.com/isp>
- <https://www.rcrwireless.com/20210225/carriers/verizon-dominated-the-c-band-auction>
- <https://www.telecompetitor.com/report-t-mobile-600-mhz-standalone-5g-improves-latency-coverage-especially-rural/>

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