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Op-Ed: Fiber is the gold standard for rural broadband - BEAD must emphasize it

by Peter Rysavy | August 25, 2025

As the federal government prepares to invest tens of billions in rural broadband through the Broadband Equity, Access, and Deployment (BEAD) program, the choice of technology is no longer just a technical decision — it is a generational one. BEAD must prioritize not only what works today, but also what will serve Americans for decades. On every metric that matters — capacity, performance, scalability, reliability, and longevity — fiber stands alone.

In my latest report, *Broadband Comparison*, I compared the full range of broadband technologies: fiber optics, coaxial cable (DOCSIS), fixed wireless access (FWA), and satellite. The results are clear and compelling. Fiber offers extremely high capacity, symmetrical multi-gigabit speeds, imperviousness to weather, and enormous scalability. A single strand of fiber can carry more than 300 terabits per second — that's hundreds of times more than the bandwidth of the entire radio spectrum up to 100 GHz.

This capacity advantage is not theoretical. It directly translates to better service quality for households and businesses: higher speeds, lower latency, and far fewer slowdowns during peak usage. Fiber also enables the deployment of technologies such as 5G and beyond. It is, by far, the most future-proof technology available.

By contrast, other technologies have limitations that will compromise rural America except in special circumstances. Cable systems, which use legacy coaxial infrastructure, suffer from signal degradation over distance and are vulnerable to theft and corrosion. While DOCSIS 4.0 provides high throughput, it cannot match the reliability and capacity of fiber.

Because fiber is not always a practical solution for every endpoint, wireless technologies, including FWA, can help bridge gaps, especially with the widespread deployment of 5G. Mid-band 5G can effectively serve less dense population areas, but its capacity and performance are limited by available spectrum. mmWave fixed wireless access (FWA), with access to more spectrum than mid-band frequencies, offers faster speeds and greater capacity, but it works only over short distances and is sensitive to obstructions.

Satellite services like Starlink are well suited for some remote areas, but their inherently low capacity in terms of users per square mile, short satellite lifespans, and the need for line-of-sight, disqualify them as a long-term, widespread solution for BEAD goals. In both third-party tests and on its own website, Starlink fails to consistently meet the 100 Mbps download and 20 Mbps upload thresholds required by the program. At $120/month, it is also one of the most expensive options on the market.

Crucially, fiber is not only the best performing option today—it's also the most cost-effective over time. Its lifespan can exceed 40 years with minimal maintenance. By investing in fiber now, BEAD can avoid the recurring costs of patching or replacing inferior systems.

The stakes are high. Rural Americans deserve broadband that doesn't just meet today's standards, but exceeds them for generations to come. BEAD is a once-in-a-generation investment. Let's not squander it on half-measures. Let's anchor our broadband future in fiber — because anything less will shortchange the promise of digital equity.

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