



Thinking Bigger: Fiber, BEAD, and the Infrastructure We're Leaving on the Table

An expansion of the ideas first raised in "Missed Connections"

By David J. Malfara, Sr.

A Mis[sed]Conception

In my previous article, *Missed Connections*, I argued that BEAD's well-intentioned focus on the cost of fiber-based broadband risks falling short—not because fiber is too expensive, but because we keep evaluating it through the narrowest possible lens: **"broadband internet access service" only**. The infrastructure we call "broadband" is being treated like a single-use utility. In reality, it's the connective tissue for an entire new layer of government and community operations.

Fiber isn't just for streaming Netflix and joining Zoom calls. It's for synchronizing electric grids, reading water meters, connecting smart streetlights, powering emergency response systems, enabling remote education, advancing healthcare, and more. These functions all require the same underlying fiber infrastructure—but BEAD dollars only account for the narrow slice called "broadband internet access service."

Here's the consequence of that limited framing when states evaluate competing BEAD applications: they often see fiber as more expensive than fixed wireless or low Earth orbit satellite. But that's only true **if you ignore every other thing fiber can do**.

Let's reframe the conversation. Imagine a four-strand drop fiber cable extending through a shared microduct. One strand of that cable goes to the home for broadband internet access. A second connects a smart electrical meter. A third links to a municipal water meter. The fourth is a spare, ready to support a future telehealth connection, community anchor institution, or public safety device. In this model, **BEAD pays for one strand**—but all four are installed for essentially the same price because the cost of a 1-strand drop cable is a "rounding error" less than the cost of a 4-strand drop cable.

Why are we treating that drop as a \$1,000 broadband expense when it's really a \$250 infrastructure share? That's the bigger picture we're missing.

And this principle doesn't just apply to drop cables. Across a metropolitan or rural deployment area, the cost of placing a small-count fiber cable dedicated solely to broadband internet access service is effectively the same as placing a higher-count cable designed for multi-use. In fact, a modern 864-strand optical fiber cable can be manufactured to diameters of about a half an inch, capable of providing more than 1Tbps symmetrical speeds per fiber.

Fiber Cable Model	Fiber Count	Outer Diameter (mm)	Outer Diameter (inches)
Corning MiniXtend® Indoor/Outdoor Ribbon Cable-200 Flow 864	864	14.5 mm	~0.57 in
Corning MiniXtend® Ribbon Cable-200 Flow 864F	864	13.5 mm	~0.53 in
CommScope D-864-LN-RR-F12NS/8W/99H	864	21.0 mm	~0.827 in
Prysmian Group Sirocco HD 864-fiber microduct cable	864	11.0 mm	~0.43 in
Lightera RollR 200 864-fiber cable	864	11.4 mm	~0.45 in

This capacity, combined with its physical efficiency, far exceeds the future-proofing potential of any other technology. When preparing an area for future needs—municipal smart systems, emergency services, institutional networks—nothing compares to fiber's ability to carry every form of data traffic now and decades into the future.

Finally, this isn't hypothetical. The Infrastructure Investment and Jobs Act (IIJA) wasn't just about broadband. It included tens of billions of dollars for smart grid upgrades, transportation infrastructure, water modernization, and public safety—**all of which require broadband infrastructure to function effectively**. Here's a snapshot of what's available *outside* BEAD:

Program	Administering Agency	Approximate Funding	Broadband-Relevant Uses
Tribal Broadband Connectivity Program	NTIA	\$2 billion	Fiber to tribal lands
Middle-Mile Infrastructure Program	NTIA	\$1 billion	Regional fiber backbones
ReConnect (Rural Broadband)	USDA	\$1.926 billion	Rural last-mile fiber and FWA

Grid Resilience & Innovation Partnerships (GRIP)	DOE	~\$10.5 billion	Fiber to substations and smart meters
Smart Grid Investment Grants (SGIG)	DOE	\$3 billion+	Communications for AMI and grid systems
Clean & Drinking Water State Revolving Funds	EPA	\$35–40 billion	Supports smart metering and monitoring
NEVI (EV Charging Infrastructure)	DOT	\$5 billion	Broadband for EV charging & ROW conduit
Reconnecting Communities / SMART / Bridge Programs	DOT	Tens of billions	Conduit and smart infrastructure coordination

Every one of these programs can support or benefit from shared fiber infrastructure. And yet, BEAD reviewers are often forced to assess fiber projects in isolation, without factoring in how many other agencies—and how many other local needs—could ride that same duct, handhole, or vault.

This lack of coordination creates false cost comparisons. Fixed wireless might look cheaper when you ignore its inability to carry multi-agency value. LEO satellites might appear quick to deploy, but they can’t power a smart grid, or secure a public utility against cyberattack. Only fiber gives you that capacity.

And the rules allow this. BEAD does not prohibit shared use. In fact, NTIA’s guidance encourages dig-once deployments, cost-sharing, and future-proof designs. You can place a microduct array or multi-strand fiber drop under BEAD, pay for only what is needed to deliver broadband internet access service to unserved and underserved premises, and leave the rest available—at no added BEAD cost—for smart grid, water infrastructure, and public institutions.

We must stop thinking of broadband internet access service, and even BEAD itself, as a standalone goal. These are components—critical ones, yes—but still just parts of a much larger ambition: the modernization of a community’s entire infrastructure ecosystem. Broadband is not an endpoint. It is the digital foundation upon which smarter water systems, more resilient power grids, efficient transportation networks, and responsive public services will all depend. If BEAD deployments are designed in isolation, we risk building one lane of a highway meant to carry ten times the traffic. But if BEAD is leveraged in concert with other IJIA programs, it can lay the fiber backbone not only for connectivity—but for transformation.

The Challenge Isn’t Policy—It’s Perspective.

If states want to stretch their BEAD dollars further, they must **think bigger**—and that starts with how they **evaluate subgrant applications**. State broadband offices must move beyond simplistic cost-per-location metrics and begin to factor in the **non-monetary, long-term public value** that

fiber projects—especially those designed to serve multiple public infrastructure needs—can deliver.

The original BEAD NOFO (May 2022) had required states to prioritize end-to-end fiber “Priority Broadband Projects” (PBPs), unless such a project was found to be impractical. However, the **June 6, 2024 Restructuring Policy Notice** rescinded that fiber-specific preference and removed the PBP designation as a decisive award factor. What remains is a performance-based, technology-neutral framework in which the **lowest-cost compliant proposal** is favored—but states **may still consider non-cost factors** such as scalability, infrastructure durability, and alignment with other federal infrastructure goals, **as long as the cost difference does not exceed 15%**.

This means states can still support fiber deployments when they bring **multi-agency value**—but they must document the public return clearly and ensure the overall cost remains within a justifiable range.

A fiber route that connects homes today and meters tomorrow isn’t just more robust—it can be **more cost-effective over time**. It prevents repeat trenching. It enables co-funded infrastructure. It future-proofs the public investment.

When state broadband offices apply these broader evaluative principles, they not only comply with NTIA’s restructured guidance—they build smarter, more resilient infrastructure for their communities. That’s how we stretch BEAD dollars. That’s how we justify fiber not just on bandwidth, but on **total public return**.

This is what no other technology can offer. It’s why fiber isn’t more expensive—it’s **more valuable**.

If we evaluate fiber the right way, we’ll stop calling it too costly—and start calling it what it is: **essential infrastructure** for everything that follows.

For additional background, see my original article: *Missed Connections*, where I first raised the need to align fiber deployments with broader infrastructure investments.

About the Author

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References

- BEAD NOFO (May 2022), Section I.C.aa, p. 17: Original definition of Priority Broadband Project.
- BEAD NOFO (May 2022), Section IV.C.1.a, p. 38: Original prioritization requirement for PBPs.
- NTIA Restructuring Policy Notice (June 6, 2024): Supersedes PBP prioritization and defines allowable non-cost factors within 15% cost margin.