

WHITE PAPER

Expanding the Fiber Business Case with Next-Generation FWA

Broadband Challenges for Fiber:
A Business Perspective



Fiber-to-the-home (FTTH) remains the gold standard for broadband performance; however, deploying it in rural and low-density areas presents significant challenges. The high cost of fiber installation in sparsely populated regions, combined with obstacles such as rugged terrain and complex permitting processes, can make large-scale deployment impractical without financial support.

Matt Haverfield, Network Operations Manager for Illinois Electric Cooperative, perfectly represents this conundrum: “Fiber costs way too much in low-density applications. It’s just not feasible to deploy at scale without a government subsidy.”

Federal funding programs such as the Broadband Equity, Access, and Deployment (BEAD) program and the Rural Digital Opportunity Fund (RDOF) are designed to support broadband expansion. However, they come with strict requirements that may pose challenges for fiber-only deployments. RDOF, for example, mandates that 40% of eligible locations be built within three years of funding authorization, with continued 20% increments per year until full network construction. BEAD imposes similar requirements. These timeframes often force providers to make difficult trade-offs between affordability and scalability.

Many service providers initially plan for 100% fiber deployments when securing funding. However, they often encounter unexpected obstacles, such as project delays and budget constraints, which put them at risk of incomplete networks and potential forfeiture of funds.

Given these challenges, service providers are increasingly turning to hybrid broadband models that incorporate both fiber and advanced fixed wireless solutions. A hybrid approach delivers benefits along multiple dimensions, including faster expansion, revenue acceleration, operational efficiency, and better competition.

Tarana: The Next Generation of FWA

Historically, fixed wireless access (FWA) has been perceived as inferior to fiber in terms of speed and reliability. However, next-generation fixed wireless (ngFWA) technology, such as that developed by Tarana, offers a fiber-class broadband experience that meets funding program requirements while significantly reducing deployment costs and timelines. This includes:

- › **Unmatched Interference Cancellation:** Tarana’s interference and noise cancellation ensures reliable, high-speed connectivity even in crowded, noisy RF environments. Features like asynchronous burst interference (ABIC) reduce the impact of bursty interference, such as from nearby Wi-Fi transmitters. Less interference means more reliable, higher-speed connections.

- › **Superior Non-Line-of-Sight (NLoS) Performance:** Rugged terrain and trees can block other wireless technologies, making links either unusable or very poorly performing. Tarana overcomes this with fine-grain Tx and Rx digital beamforming, distributed massive MIMO at both ends of the link, and perfect multipath integration.
- › **Scalability and Speed:** Providers can deploy gigabit broadband at large scale in weeks, not months or years. High-speed connectivity is deployed faster — accelerating service and revenue timelines — bridging the digital divide quickly, efficiently, and affordably.

Enhancing Fiber Networks with ngFWA

Given the advantages of ngFWA, it is the perfect complement to fiber and has been used successfully by fiber providers both as a way to secure new funding and to rapidly expand in areas that might otherwise take months or years to reach. With ngFWA, providers can build fiber where it is cost-effective while reaping the benefits of rapid deployment in other areas with wireless. The payoff for providers is manifold:

- › **Strategic Expansion:** Expand coverage into costly or hard-to-reach areas.
- › **Faster Revenue:** Accelerate time to market and revenue generation.
- › **Operational Efficiency:** Optimize resource allocation while meeting funding deadlines.
- › **Competitive Advantage:** Strengthen defenses against competitors.

“We treat ngFWA just like fiber,” said Bill Stueber, Senior Partner at Telecom Partners Group and Senior FWA Architecture Advisor to PhireLink. This gives PhireLink a competitive edge, particularly when defending existing networks from other providers. Tarana allows PhireLink to rapidly deploy high-quality broadband and stay ahead of the competition.

DigitalC, another Tarana provider, exemplifies rapid deployment success. “We estimate we can cover Cleveland in just 18 months,” said Jose Valdez, Chief Operating Officer for DigitalC. As of the end of 2024, DigitalC had reached 88% of all wards in Cleveland and an 865% year-over-year increase in connections made in one month. This is the kind of deployment speed that can deliver a decisive, first-to-market advantage for high-speed broadband.

Performance Validation and Cost Savings

Service providers using Tarana’s ngFWA technology have amply demonstrated its ability to deliver fiber-class performance.

Stueber shares, “We were getting 750 Mbps in places that were 6 miles or more out from the tower. That made us believers. Now, we’re using Tarana as a tool to expand our fiber footprint. Our goal is to provide broadband faster and with less investment than would otherwise be available with fiber for those types of areas.”

This success is reflected in broader cost analyses, which further demonstrate ngFWA’s financial and operational advantages.” A [comparative digital divide deployment cost study](#) examined the publicly available information for a sample case for a rural county in Idaho. The study compared real-world costs between an all-fiber deployment and one utilizing next-generation fixed wireless to deliver broadband to underserved and unserved communities. Based on this information, **the estimated cost to deliver fiber was \$24,578 per location compared to next-generation wireless’ more practical sum of \$2,483 per location – a tenfold reduction.**

Bonner County Network Economic Profiles

Locations to Pass	18,715 (un + underserved)
Illustrative Take Rate	50%
Locations to Serve	9,408

Two Scenarios

Technology	(1) Fiber	(2) Wireless - ngFWA
Cost Estimate Source	132 DD projects	Tarana ISPs

Cost of Locations Passed

			\$k ea.	Qty	\$M
Distribution Fiber Total, \$M (all greenfield)	185.5	New towers	250	22	5.5
		Tower installs (inc. BN)	125	40	5.0
		Fiber or relays for 1.8%	10	345	3.5
		Total			14.0
\$ Per Location Passed	9,861				741

Cost of Locations Served

Locations-Passed Total \$M (from above)	185.5	CPEs & installation	1.0	9,408	9.4
Laterals & Connections, \$M	45.7				23.4
Total \$M	231.2				
\$ Per Location Served	24,578				2,483

This calculation does not consider permitting or pole make-ready work for aerial deployments. A [Pew study](#) shows providers can wait months or even years to get permits for pole attachments. Make-ready costs can be substantial (\$2,000 to \$15,000 per pole) depending on the poles' condition and ability to accept new fiber. Even at the low end, a typical rural deployment of 15 poles per mile could add \$30,000 per mile of additional costs. This type of expense can push a fiber deployment from expensive to impractical, given projected revenue and timeframe.

Managing Subscriber Churn with ngFWA

One significant factor in any broadband network is churn. With wireless, the cost of a subscriber churned is far less than that of a fiber subscriber. "Fiber churn is expensive," said Stueber. "Once you've run the fiber, especially in isolated or remote environments, there's no way to recover the cost of subscriber churn. With FWA, you can take the radio and move it somewhere else." This type of easy resource allocation and optimization is a key differentiator for wireless.

Tarana also keeps the overall churn rate down, typically at or less than 1%. One example is AtLink, where the churn rate went from 5% with legacy FWA subscribers to less than 1% for those switched to Tarana.

"They're not leaving us when they have Tarana. There is literally almost no churn whatsoever."

—Brad Welch, COO, CentraCom

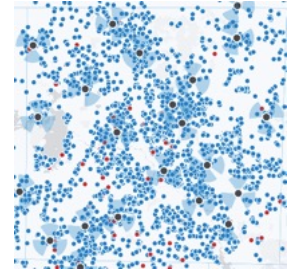
Providers who have installed both Tarana and fiber see fiber and Tarana as functionally equivalent in terms of subscriber experience. "Once deployed, Tarana just works," said Sebastian Ivanisky, Chief Technology Officer of VTX1. "Our Tarana customers are just as happy as our fiber customers. For them, there is no difference."

Meeting Funding Obligations with ngFWA

Tarana innovations, combined with the ease of deployment of fixed wireless, mean providers can deploy reliable gigabit broadband to meet their funding obligations and do so well within the program requirements:

- › Deliver speeds up to 1 Gbps with low latency.
- › Eliminate the need for extensive trenching and fiber runs, significantly reducing upfront capital expenditure. This is especially true for locations with challenging terrain.
- › Deploy service in weeks rather than months or years.
- › Noise cancellation ensures consistent performance even in noisy RF environments, making it a reliable choice for areas with spectrum constraints.
- › Tarana can be scaled incrementally, enabling providers to expand coverage as demand grows, often serving as a bridge to later fiber deployment.

As a case in point for the speed of deployment, Nextlink was able to deploy Tarana to cover 95% of [Wise County, Texas](#), in just 7 months. The county has 65,000 residents and covers 877 square miles.



Bill Baker, CEO of Nextlink, sums up their approach, “With the power of hybrid infrastructure, fiber and next-gen fixed wireless together, we can leverage both technologies in a complementary way to bring excellent internet to rural areas much sooner. We had 1,000 customers on Tarana G1 within a month after deploying towers.” This speed allowed Nextlink to enter the market and rapidly generate substantial revenue.

In another case, Taylor Telecom successfully completed three sites in just a matter of weeks. “From the time we committed to doing it — to ordering the equipment from Tarana, the tower, the tower crews, and everything we had to do — that tower went up in 89 days. That speed has been crucial for our E-ACAM buildout,” said Ricky Martinez, General Manager and CEO.

These are just two examples of how rapidly wireless broadband can be deployed and revenue generated compared to other methods.

The Future of Broadband: A Hybrid Approach


The future of broadband deployment isn’t a binary choice between fiber and wireless. Instead, a hybrid approach that leverages both technologies optimizes cost, scalability, and efficiency.

“Fiber is the right choice when density meets demand, offering virtually unlimited bandwidth in the right conditions. Fixed wireless excels where fiber falters — bridging the digital divide in areas where terrain, cost, or infrastructure gaps make fiber impractical,” said Stueber.

A hybrid approach is about leveraging the strengths of fiber and wireless to achieve the mission of connecting everyone affordably. By integrating ngFWA into their broadband strategies, service providers can maximize coverage, accelerate revenue, and meet critical funding program requirements while ensuring high-quality service for customers.

Tarana’s field-proven ngFWA technology is well-positioned to support a hybrid broadband model that offers the best of both worlds: low-latency gigabit broadband that can be quickly deployed anywhere at a reasonable cost and deployment timeframe.

“We’re still trying to find the limits of the Tarana solution,” said Haverfield. “With Tarana, we can deliver high-speed broadband to our customers that exceeds their expectations.”

A solid blue horizontal bar with a rounded right end, located on the left side of the page.

As broadband demand grows, service providers who embrace both fiber and next-generation fixed wireless will be best positioned to deliver high-speed, cost-effective connectivity to all communities, ensuring long-term success in a competitive market.

Interested in learning more about our innovative solutions? Get in touch with us at taranawireless.com/how-to-buy

Tarana's mission is to accelerate the deployment of fast, affordable, and reliable internet access around the world. Through a decade of R&D and over \$400M of investment, the Tarana team has created and continues to enhance a unique suite of next-generation fixed wireless access (ngFWA) technologies. Its G1 and G2 platforms deliver game-changing advances in broadband economics in mainstream and underserved markets, using both licensed and unlicensed spectrum. Tarana's ngFWA technology has been embraced by more than 300 service providers in 24 countries. Tarana is headquartered in Milpitas, California, with additional research and development in Pune, India.

© Tarana Wireless, Inc. All rights reserved. 250900

@taranawireless taranawireless.com

