

Labor: The Underlying Problem in Fiber Deployment and How to Solve It

Manufacturers and service providers are pursuing product solutions that require less skilled labor and reduce the overall time of deployment with craft-friendly designs.

By Kevin Morgan / *Clearfield*

The industry is racing toward passing more homes with fiber over the next five years than all homes in the previous 20 years. How can the fiber industry keep up? What new and innovative techniques are being used to hit these milestones? Let's look at how the fiber-to-the-home (FTTH) industry has evolved, what new methods are fueling the fiber push, and what insights providers can gain about the technologies that are changing lives in communities across the country.

Now is a critical time for fiber-fed broadband. The latest statistics indicate that fiber broadband now passes 60 million unique homes in the U.S. Of these, more than 25 million homes relate to fiber. In addition, more new yarn is expected to be deployed in the five years from 2021–2025 than during all fiber deployments in the previous 20 years.

Market forces have led several large ILECs to publish their goals to pass homes with fiber, including:

- AT&T – 30 million by 2025
- Frontier – 10 million by 2025
- Lumen – 12 million by 2027
- Apollo/Brightspeed – 3 million by 2027

ONCE-IN-A-GENERATION INVESTMENT

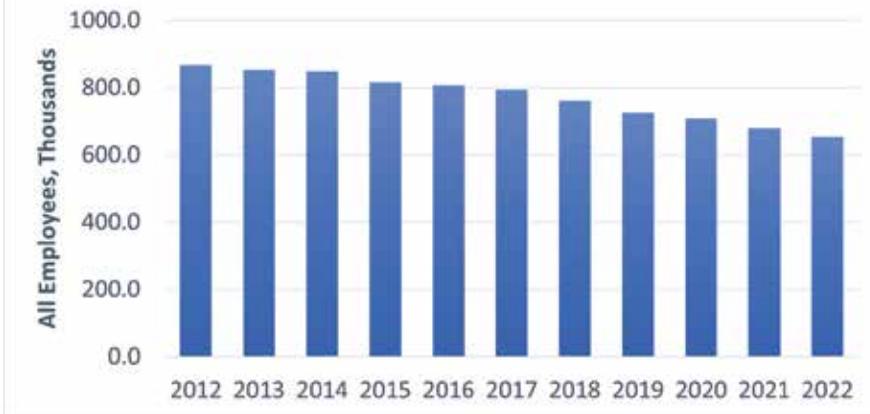
During the pandemic, the government recognized the need for high-speed broadband to enable remote work, telehealth and distance learning. This awareness led to the passage of federal laws with bipartisan support for

funding the construction of high-speed broadband networks over the next five years, supplementing the affordability of financing initiatives intended to bridge the digital divide. Altogether, these government-funded programs will inject more than \$100 billion into the U.S. economy, and fiber is expected to be the primary technology used in deploying these high-speed broadband networks. The subsidies are also expected to specify aggressive buildout timelines with penalties for missing deadlines.

The most significant funding (\$65 billion) comes from the Infrastructure, Investment, and Jobs Act (IIJA). Within the IIJA, the Broadband Equity Access and Deployment (BEAD) Program set aside \$42.45 billion for constructing these networks, with the rules for accessing grant funds administered by the National Telecommunications & Information Administration (NTIA). All subgrantees that receive BEAD funding for network deployment must deploy the planned broadband network and begin providing services to every customer who desires broadband services within the project area no later than four years after the subgrantee receives the subgrant from the eligible entity.

This is a historic, once-in-a-generation investment in broadband, but the industry faces a lack of labor that threatens to throttle this market. According to the Bureau of Labor Statistics, U.S. telecommunications employment dropped 25 percent in the last decade, from

U.S. Telecommunications Employment



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868,000 to 653,000 workers. In addition, contractors are having a challenging time finding the skilled workers they need for construction. The skilled labor shortage is a critical issue the fiber industry faces.

OVERCOMING SUPPLY OBSTACLES

Market forces, government funding and labor shortages contribute to the boom now happening across the board in the fiber industry. All this is unfolding as fiber equipment suppliers work their way out of global raw material shortages initially caused by pandemic shutdowns, which also significantly disrupted the transportation of goods into seaports.

Service providers elected to deploy fiber in a big way must investigate new methods to remove obstacles. The pace of fiber deployment is expected to increase, and product solutions that require less skilled labor and reduce the overall time of deployment with craft-friendly designs are needed. If service providers can avoid permitting and rights-of-way applications, they can save months on their deployments. Faster turnup times yield quicker time-to-revenue for network service providers.

One fundamental decision made by the outside plant engineer function within the network service provider will be the type of passive optical

network (PON) topology. The FTTH network can support several topologies, including homerun, centralized split, distributed split and distributed tap. Each has pros and cons.

NEW FIBER MANAGEMENT PROCESSES

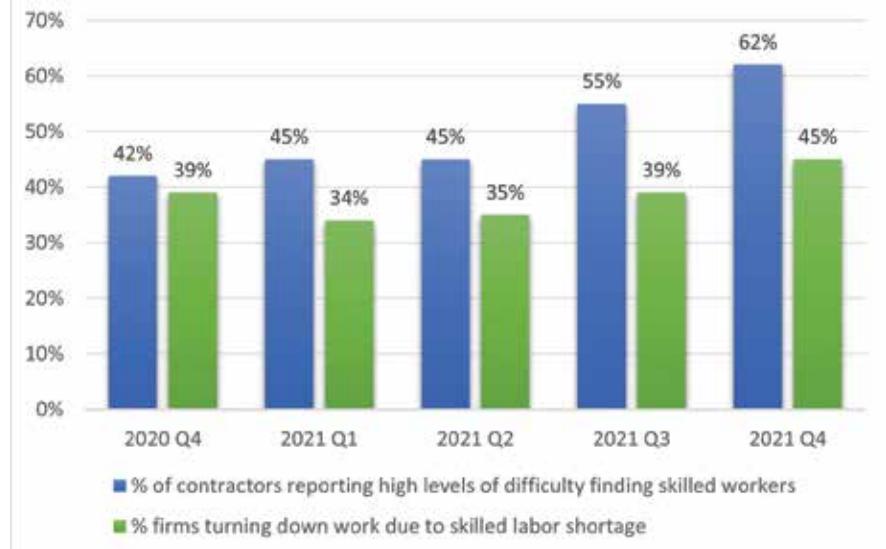
Keen fiber-based service providers are actively looking for new methods to

increase the speed of fiber deployments. They are asking the right questions: Are we using the correct deployment method that yields the fastest time to market? What should we do differently? Is there any way we can avoid paying penalties for missing deadlines if we apply for and accept federally funded grants?

In response to the challenges, manufacturers on the fiber-management side of the industry are developing new methods to help operators answer these questions. This starts with craft-friendly deployment tools that speed time to revenue and require less skilled labor to deploy fiber.

For example, fiber distribution hub (FDH) cabinets traditionally include a high-count fiber tail from the factory that is spliced into the feeder (F1) and distribution (F2) fibers in the field within a splice case at a vault near the cabinet. This requires several steps: opening the vault, pumping the maintenance hole, setting up safety cones and signs impacting traffic, prepping multiple F1 and F2 cables, opening the splice case, preparing the tray, bringing the fiber tails to the splice point, splicing the fibers, closing the splice case, and properly securing the F1 and F2 cables. The total installation

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Contractors report increased difficulty finding skilled workers and that they are turning down more work.

INDUSTRY ANALYSIS

	Home Run	Centralized Split	Distributed Split	Distributed Tap
Amount of Fiber Required	MORE			LESS
OLT Port Utilization	BETTER			WORSE
Engineering Complexity	LESS			MORE
Flexibility/Upgradability	BETTER			WORSE
Testing/Monitoring	BETTER			WORSE
Amount of Splicing Required	MORE			LESS
CAPEX	MORE			LESS
Time to Build	MORE			LESS
Time for Customer Turnup	MORE			LESS



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can take between six to nine hours depending on the cabinet size and whether it's aerial or pole-mounted. This type of installation is supported through a modular, 12-port, patch-only Clearview cassette with the fiber tail spliced in at the factory.

To stay competitive and reduce operational costs, service providers prefer Clearfield's FastPass approach using in-cassette splicing as they upgrade their outside plants to all-fiber networks.

By utilizing in-cassette splicing, the FDH cabinets ship from the factory without fiber tails and instead are equipped with Clearview cassettes ready for splicing in the field. The cabinet is also safer for the technicians because there are no traffic concerns found with

legacy methods. The F1 and F2 fibers terminate directly in the cassette.

An essential benefit for providers utilizing this method is that they can align their capital costs with subscriber take rates. The requirements for this operation are to prep only as many F1 and F2 cables as there are cassette ports, prep the cassette, bring the cassette to the fiber tails for splicing, splice the fibers in the cassette, put the cassettes back in the cabinet, and adequately secure the F1 and F2 cables. The installation time with in-cassette splicing takes two to five hours, depending on the size and mounting. That's a 50 percent savings in time compared with legacy methods. We've learned that with homes passed affecting service provider success, rapid service turnup is necessary.

Increased market demand for gigabit-class services drives greenfield deployments, competitive overbuilds, and replacement of legacy copper and coax with future-proof networks.

With increased market demand for fiber networks and an influx of federal funding on the way, carriers must look for ways to overcome the skilled labor shortages to stay competitive and quickly deploy fiber to communities across the country. By taking advantage of new techniques and more efficient, craft-friendly technologies such as FastPass, carriers can cut fiber cabinet installation times in half – speeding time to revenue. ❖

Kevin Morgan is the chief marketing officer at Clearfield.

He also serves as 2022 chair of the Fiber Broadband Association's board and previously was a two-time elected board chair (2015, 2019) after first joining the board in 2010.



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