



CAN WE REALLY **BRIDGE THE DIGITAL DIVIDE** WITHOUT WORKFORCE INVESTMENT?

By Catherine Sbeglia Nin



(Image courtesy of 123RF)

INTRODUCTION: THE HUMAN CAPITAL PERSPECTIVE

While ubiquitous access to reliable and affordable broadband has long been needed, the Covid-19 pandemic put this harsh reality — and the true extent of it — front and center as those lacking adequate connectivity struggled to make the necessary shift to online work, school and personal connection. And the U.S. government responded, earmarking billions of dollars for broadband deployment in the form of various legislative measures. One such measure is the \$42.5 billion in federal funding for the Broadband Equity, Access and Deployment (BEAD) program.

Last June, the Biden administration announced how it will allocate these funds

to U.S. states and territories, with Texas and California receiving the largest sums at \$3.3 billion and \$1.86 billion, respectively. An additional 17 states will receive more than a billion dollars each for broadband deployment funding.

Now it's on the states and their internet service providers (ISPs) to decide how these funds will be used to close the digital divide. And while the money will go a long way in addressing the previously understood biggest barrier — cost and the nonexistent or too-slow ROI — internet service providers (ISPs) are now asking another important question: Now that they can afford to extend their networks, who is going to build them?

“From a human capital perspective, you can throw a lot of money out there, but you have to have the people,” NB+C’s Vice President of Human Capital Kara Silbert said. “It’s a small industry ... and it’s hard to attract people.” As a telecommunications infrastructure development company, NB+C plays a pivotal role in fiber build outs by providing construction services, including a workforce, for its clients.

This report takes a deeper look at the ongoing pain points around attracting the next generation of telecom workers — the ones that money alone won’t solve — and some of the industry initiatives focused on addressing them.



Kara Silbert

Vice President of Human Capital,
NB+C

“From a human capital perspective, you can throw a lot of money out there, but you have to have the people.”

BEAD eligibility and allocations

All 50 States, District of Columbia and Puerto Rico, as well as the U.S. Virgin Islands, Guam, American Samoa and the Commonwealth of the Northern Mariana Islands are eligible for BEAD funding. Example of eligible uses include:

- Planning for the deployment of high-speed Internet, including conducting research, collecting data, outreach and training
- Deploying or upgrading Internet in unserved or underserved areas or improving service to community anchor organizations
- Installing Internet and Wi-Fi in multi-unit residential buildings
- Adoption and digital equity programs
- Workforce development programs and vocational training

BEAD allocations by U.S. state or territory:

ALABAMA	\$1,401,221,901.77
ALASKA	\$1,017,139,672.42
ARIZONA	\$993,112,231.37
ARKANSAS	\$1,024,303,993.86
CALIFORNIA	\$1,864,136,508.93
COLORADO	\$826,522,650.41
CONNECTICUT	\$144,180,792.71
DELAWARE	\$107,748,384.66
DISTRICT OF COLUMBIA	\$100,694,786.93
FLORIDA	\$1,169,947,392.70
GEORGIA	\$1,307,214,371.30
HAWAII	\$149,484,493.57
IDAHO	\$583,256,249.88
ILLINOIS	\$1,040,420,751.50
INDIANA	\$868,109,929.79
IOWA	\$415,331,313.00
KANSAS	\$451,725,998.15
KENTUCKY	\$1,086,172,536.86

A SHRINKING AND AGING WORKFORCE

According to the Bureau of Labor and Statistics (BLS), the number of jobs in the U.S. in 2021 that fall under the category of telecommunications equipment installers and repairers was 178,000. And in 2022, it increased to 299,300. The agency expects the numeric change in employment from 2021 to 2032 to be 18,900 in this sector. Further, the BLS projects that overall employment of telecommunications technicians will grow 6% from 2022 to 2032, faster than the average for all occupations.

“The continued push for increased broadband access to underserved areas is resulting in workforce need for buildout of physical internet connections, especially during the COVID-19 pandemic and its spotlight on home internet use,” Christine Machovec, an economist with the BLS, previously confirmed for *RCR Wireless News*. “5G and broadband expansion to underserved areas of the country have spurred current demand for telecommunications line installers and repairers and telecommunications equipment installers and repairers [as] government investment in the telecommunications sector has supported construction of broadband and mobile internet connections.”

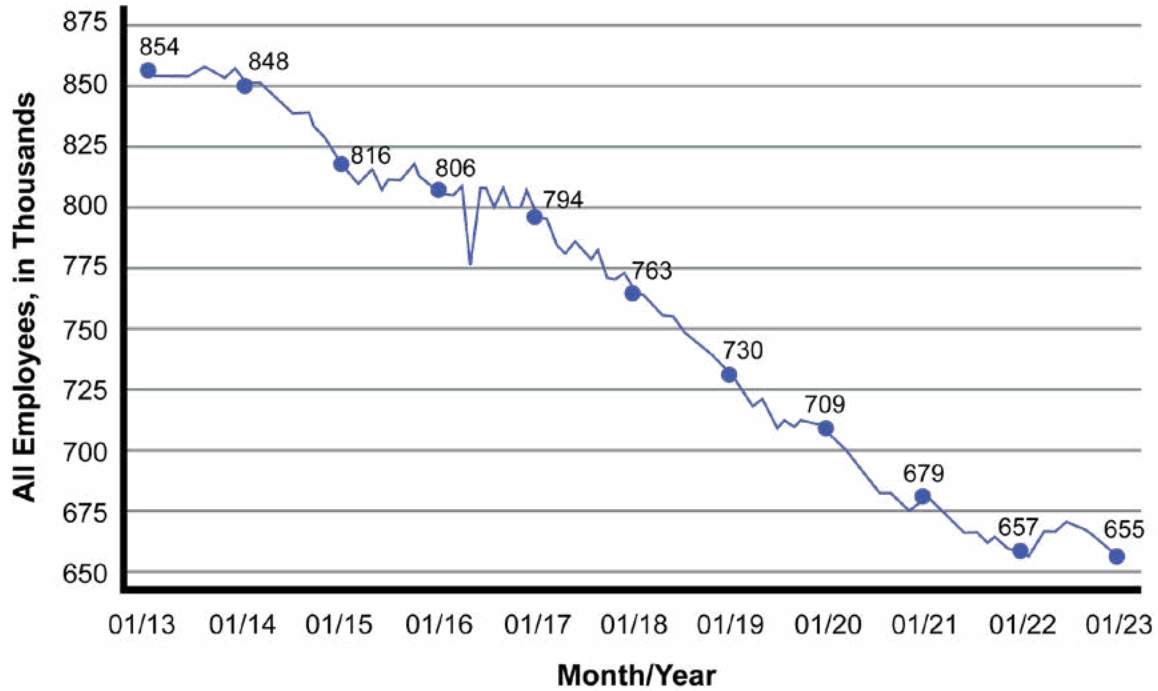
When *RCR Wireless* checked research firm Zippia’s stats last year, there were more than 23,625 fiber optic technicians employed in the U.S. as of September 2022. Unfortunately, the firm’s latest stats show that this number has dropped to 19,840.

In addition to being a shrinking industry, telecom is also an aging one: According to Deborah Kish, the VP of workforce development at the Fiber Broadband Association (FBA), 60% of the current fiber tech workforce is on a retirement path. This fact, paired with no efficient pipeline in place to bring in new workers and the reality that BEAD is estimated to create 150,000 telecom jobs, has left a glaring skills gap that seems particularly challenging to fill.

In fact, the FBA predicts that 205,000 fiber optic technicians will be required across the country over the next five years. Kish explained that it arrived at this number by creating a formula using BLS data, the average crew size plus how many miles of fiber are expected to be built. It also found that from 2013 to 2023, the number of telecommunications employees in the U.S. has steadily decreased.

LOUISIANA	\$1,355,554,552.94
MAINE	\$271,977,723.07
MARYLAND	\$267,738,400.71
MASSACHUSETTS	\$147,422,464.39
MICHIGAN	\$1,559,362,479.29
MINNESOTA	\$651,839,368.20
MISSISSIPPI	\$1,203,561,563.05
MISSOURI	\$1,736,302,708.39
MONTANA	\$628,973,798.59
NEBRASKA	\$405,281,070.41
NEVADA	\$416,666,229.74
NEW HAMPSHIRE	\$196,560,278.97
NEW JERSEY	\$263,689,548.65
NEW MEXICO	\$675,372,311.86
NEW YORK	\$664,618,251.49
NORTH CAROLINA	\$1,532,999,481.15
NORTH DAKOTA	\$130,162,815.12
OHIO	\$793,688,107.63
OKLAHOMA	\$797,435,691.25
OREGON	\$688,914,932.17
PENNSYLVANIA	\$1,161,778,272.41
RHODE ISLAND	\$108,718,820.75
SOUTH CAROLINA	\$551,535,983.05
SOUTH DAKOTA	\$207,227,523.92
TENNESSEE	\$813,319,680.22
TEXAS	\$3,312,616,455.45
UTAH	\$317,399,741.54
VERMONT	\$228,913,019.08
VIRGINIA	\$1,481,489,572.87
WASHINGTON	\$1,227,742,066.30
WEST VIRGINIA	\$1,210,800,969.85
WISCONSIN	\$1,055,823,573.71
WYOMING	\$347,877,921.27
AMERICAN SAMOA	\$37,564,827.53
GUAM	\$156,831,733.59
NORTHERN MARIANA ISLANDS	\$80,796,709.02
PUERTO RICO	\$334,614,151.70
U.S. VIRGIN ISLANDS	\$27,103,240.86

Number of US Telecommunications Employees, 2013 to 2023



Source: Bureau of Labor Statistics (BLS), NAICS Code: 517

“Considering the above, there is serious risk that there will not be enough feet on the ground to deliver the new networks,” the FBA warned

in its Broadband Workforce Development Guidebook. “For the states, insufficient availability of high-skilled labor will result in

workforce bottlenecks, leading ultimately to delayed or failed projects.”



(Images courtesy of Dura-Line Academy)



Powering progress through
connectivity

NB+C is a telecommunications development firm delivering excellence for more than 35 years.

From our four walls to the real world, we put next generation wireless within reach – offering a full scope of solutions, from early stage project planning to engineering and construction, for clients in the wireless, fiber and utility industries.



(Image courtesy of 123RF)

‘THROWING SPAGHETTI AT THE WALL’ – ATTRACTING THE NEW WORKFORCE

Maybe it’s because it’s a small industry, or because it’s an “in-the-family” kind of industry, or because it’s not, let’s face it, a particularly sexy one — or maybe it’s due to all of these things. Either way, getting younger generations to consider a career in telecommunications is famously hard.

“College students have no idea that this industry even exists,” said Silbert, adding that there aren’t classes with a telecom focus, not even in the majors where they probably should, like engineering, business and real estate. “Do the textbooks even have any case studies?” she questioned.

“I’m competing with every engineering firm for these kids,” she continued, echoing a similar sentiment put forth by Kish

who explained that the plumbers, the electricians, the engineers are all fighting for the same workforce.

“So, it’s a matter of who’s got the best mousetrap,” Kish quipped.

For Madison Carroll, the global program manager at Dura-Line Academy, the problem is best described as one of marketing: “We keep saying we need to have a skilled workforce, which we do, but a big piece of that is this gap in awareness. The next generation isn’t even aware that jobs in telecom and telecom construction exist — we are hearing that over and over again. It is a marketing problem. Historically, we haven’t marketed our industry to the next generation,” she stated.

When it comes to fiber and broadband technicians, specifically, we’re talking about the people outside, digging the trenches. “We’re talking utility construction,” Carroll continued. “It’s in the field and it’s tough ... but some of our smartest leaders in [telecom] started by digging the ditches because then they understand how the fiber went from the data center to the home and understanding that gives you a whole different perspective. We need to do a better job explaining the potential career paths.”

Silbert agreed, commenting: “I think the industry could use a great PR company. That’s what my team at NB+C does when we’re trying to hire new people.”

An updated message

As Kish said, attracting a workforce is about getting their attention, and so for those working tirelessly to ensure we have the workers in the field ready to build the networks that BEAD will finally make possible, changing the message has become a priority. Specifically, a new message directed at potential fiber techs and fiber engineers around working in a fast-paced environment that's doing good for the community is emerging.

"If you want to spend three years building a bridge, this is not for you. But if you're fast-paced, this is your space," said Silbert, adding that fiber projects move fast and she's finding that this is very appealing to some personalities. She also shared that BEAD's aim of closing the digital divide can't be overlooked as a potential motivation for joining the telecom workforce. "You're doing good, you're contributing [and] we're getting more into that messaging."

NTIA data shows that roughly one in five U.S. households are not connected to the Internet at home. Further troubling, households that cited "too expensive" as

their barrier to having home internet were more likely to have school-age children at home and identify as racial and ethnic minorities than those who simply weren't interested in getting online.

So, yes, being part of the effort to bridge the digital divide is noble and maybe that will appeal to some young people. This, though, has yet to be proven out. "We've been throwing spaghetti at the wall for a couple of years now, and I'll keep throwing it as long as I have to," Kish said of how she and the FBA are trying to sell the idea of a career in telecom. "I'll take the things that stick and the things that don't."

THREE TRAINING INITIATIVES FOCUSED ON FIBER

Dura-Line Academy

The Dura-Line Academy — created by high-density polyethylene conduit manufacturer Dura-Line — is an online course list of several topics related to the design, deployment and maintenance of fiber networks. Course titles include things like Fiber-Optics 101, Installation Fundamentals, Trench Installations, HDPE vs PVC and Understanding Bend Radius.

For Dura-Line, making training as accessible as possible is one of the clearest answers to

the telecom workforce dilemma. "We wanted to launch a free, online training program to teach people about networks, products and installation with the goal of helping all of these new entrants understand what they are contributing to and also understand the tangible stuff — the product, how you install it and where it's getting installed," said Carroll. "Our position is that we're going to need a lot of trained people and we have to do it in a modern, scalable, very low barrier to entry way, which is online education that anybody can access whenever they want."

It's hard to get someone to join a two-year program for an industry they've never

heard of, she pointed out, so Dura-Line is hoping that delivering the content in "more bite-sized pieces" free of charge will be the missing element in building up the telecom workforce.



(Image courtesy of the Fiber Broadband Association)

OpTIC and TIRAP

The FBA launched the Optical Telecom Installer Certification (OpTIC) Path, a series of instructor-led and hands-on courses that run 144 hours to equip future fiber technicians with the skills and knowledge required to install, splice, test and maintain Fiber to the Home (FTTH) and Fiber to the Building (FTTB) systems. FBA develops the course content and then partners with community and technical colleges and veteran programs to teach the course.

“It’s designed to bring people into the industry and reduce the amount of ROI to get people up to speed, from around six to nine months to more like one to one and half months,” said Kish.

The FBA is engaged with 44 service providers and 70 community colleges and training institutions as part of the program and electric cooperatives in Virginia, Maryland, Delaware, Tennessee and Oklahoma have either adopted or are interested in the program.

The FBA also partnered with the Wireless Infrastructure Association (WIA) on the

Telecommunications Industry Registered Apprenticeship Program (TIRAP), an apprenticeship program that trains individuals for a broad range of career paths, including wireless, tower, fiber, utility and small cell technicians.

The Corning Fiber Broadband Technician (CFBT) program

Developed in collaboration with AT&T, the goal of the Corning Fiber Broadband Technician program is to equip thousands of technicians and network specialists with the skills related to the design, engineering, installation and management of fiber broadband networks. It includes training on optical fiber and networking, network design, hands-on splicing, connectorization, field construction for cable deployment, testing and system turn-up. The program also includes network system lab visits and technician ride-alongs.

Corning’s Director of Wireless R&D and Chief Technologist Shirish Nagaraj previously

explained to *RCR Wireless News* that the company is focusing on fiber-based networks because it’s the one medium that can deliver the kind of throughput and latency necessary for the various applications 5G makes possible. “But many of the workforce and technicians that are used to doing it with copper-based technologies now have to [know] fiber-based technology. We have identified this challenge... so we are investing heavily on trying to bring up that kind of fiber knowledge in the general workforce, but also in the wireless workforce [because they] are not used to dealing with fiber-based transport,” he said.

For AT&T, fiber is central to its growth strategy. It has committed to running fiber to 30 million-plus locations by 2025, and at the Citi 2023 Communications, Media and Entertainment Conference, the company’s CFO Pascal Desroches detailed a focus on “building connectivity networks ... And there are a whole class of connectivity services that I think we can unleash through the power of 5G and through the continued evolution of fiber. I wouldn’t expect us to run far afield of that,” he said.



(Image courtesy of 123RF)

BROADBAND WORKFORCE DEVELOPMENT IS A 'CHICKEN AND EGG' SITUATION

It's important to note that the BEAD program permits states to use funding for apprenticeships and pre-apprenticeships, and community college and/or vocational training for broadband-related occupations that support broadband deployment, maintenance and upgrades.

"To access funding, [s]tates need to include plans to develop and promote sector-based partnerships in their workforce development strategies," the WIA further explained. "These sector-based partnerships will bring together relevant stakeholders from government, industry, education, and training providers to develop, implement, and promote workforce training programs."

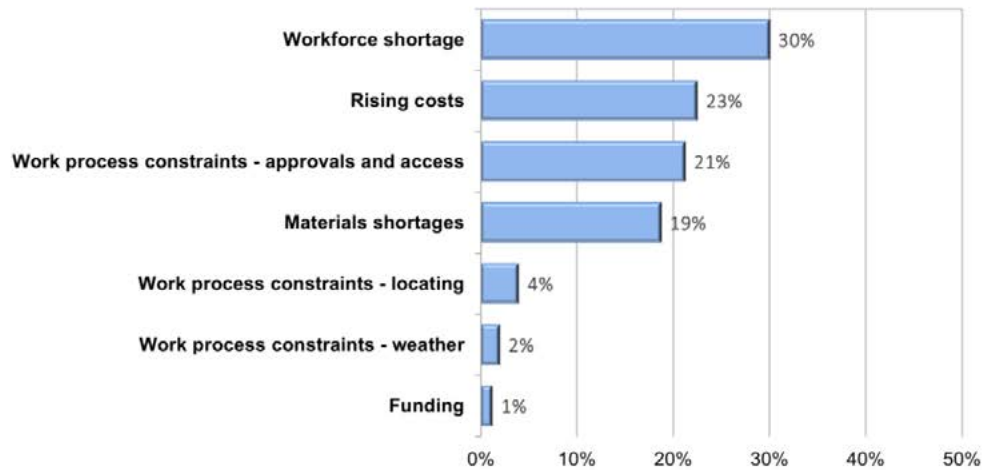
However, according to Kish, it's a bit more complicated than that. "That's what they say," she claimed, "but when the states put in their applications for the BEAD funding, they have to say how much it's going to cost to build the network. Anything in excess of what you're going to get from BEAD can go to training and education." She shared an example in which an undisclosed state told her that all of the funding they issued a submission for went to the build, and so there will be no money left for training and workforce development. "And they're not the only ones that have told me this," she said.

Nearly all ISPs are saying the same thing — that they are concerned about who is going

to build the broadband networks. In fact, last year, RVA conducted interviews with 283 small and mid-sized network operators installing fiber and noted that two main fears emerged: concerns about aspects of federal programs for funding such as BEAD, and concerns about perceived constraints to fiber broadband installation. When it zeroed in on these concerns, RVA further found that the workforce shortage was the number one concern for ISPs in 2023.

And yet, Kish is of the perspective that ISPs are not really doing much about it.

Current Network Operator Concerns About FTTH Installation Open End Responses 2023



(Image courtesy of RVA LLC)

“The ISPs aren’t the ones that hire these people — it’s the contractors. Even so, there are no jobs on the other side. No one is hiring,” she claimed. “This is the kicker: They say it’s because they don’t want to hire someone that’s been through training and then not have any work for them because they’re all waiting on the [BEAD] money.”

The biggest flaw in this thinking is, of course, that once the states receive their

BEAD allocations, ISPs have a four-year timeline to deploy. “The shot clock starts once you get that BEAD money, and if you’re not going to get building because you’re using the same people that are already overworked and old and tired, you’re not going not be able to build that network,” Kish warned, calling this a classic “chicken and egg” situation, where they’re not hiring because they don’t have the

money, but won’t be able to hire quickly enough once they do.

“It doesn’t add up,” she continued, adding that she recommends ISPs and state organizations “front load” their workforce investments because without jobs on the other side, all of these training programs and apprenticeships being developed are useless.



(Image courtesy of 123RF)

Ohio raises \$15 million for broadband, 5G workforce development ahead of BEAD allocations

Not everyone is sitting idly by, however. Ohio, for instance, is doing precisely what Kish recommends. While the state will receive more than \$793 million in BEAD funding, it seems to understand that only

a small portion of that money — if any at all — will go to workforce development. Therefore, Ohio’s Office of Workforce Transformation raised \$15 million for broadband and 5G workforce development ahead of BEAD funding allocations as part of the ‘Strengthening Ohio’s Broadband & 5G Workforce’ initiative. According to the Office, this is enough funding for “two calendar years.”

“The ‘Strengthening Ohio’s Broadband & 5G Workforce’ strategy underscores the significant public and private investments being made in broadband and 5G at the state and federal level, which in turn is expected to create tens of thousands of jobs in Ohio over the next decade,” states Ohio’s

Department of Development website. It goes on to detail a strategy that highlights broadband industry career awareness and more training and education opportunities.

Specifically, Ohio is using the money raised to develop curriculum and internships to increase broadband industry career awareness to middle school and high school students, as well as additional education and training programs to educate and train Ohioans. It is also capitalizing on state and federal funding programs, like TechCred and WIOA, to help finance the education and training to bolster the state’s talent supply.

CONCLUSION

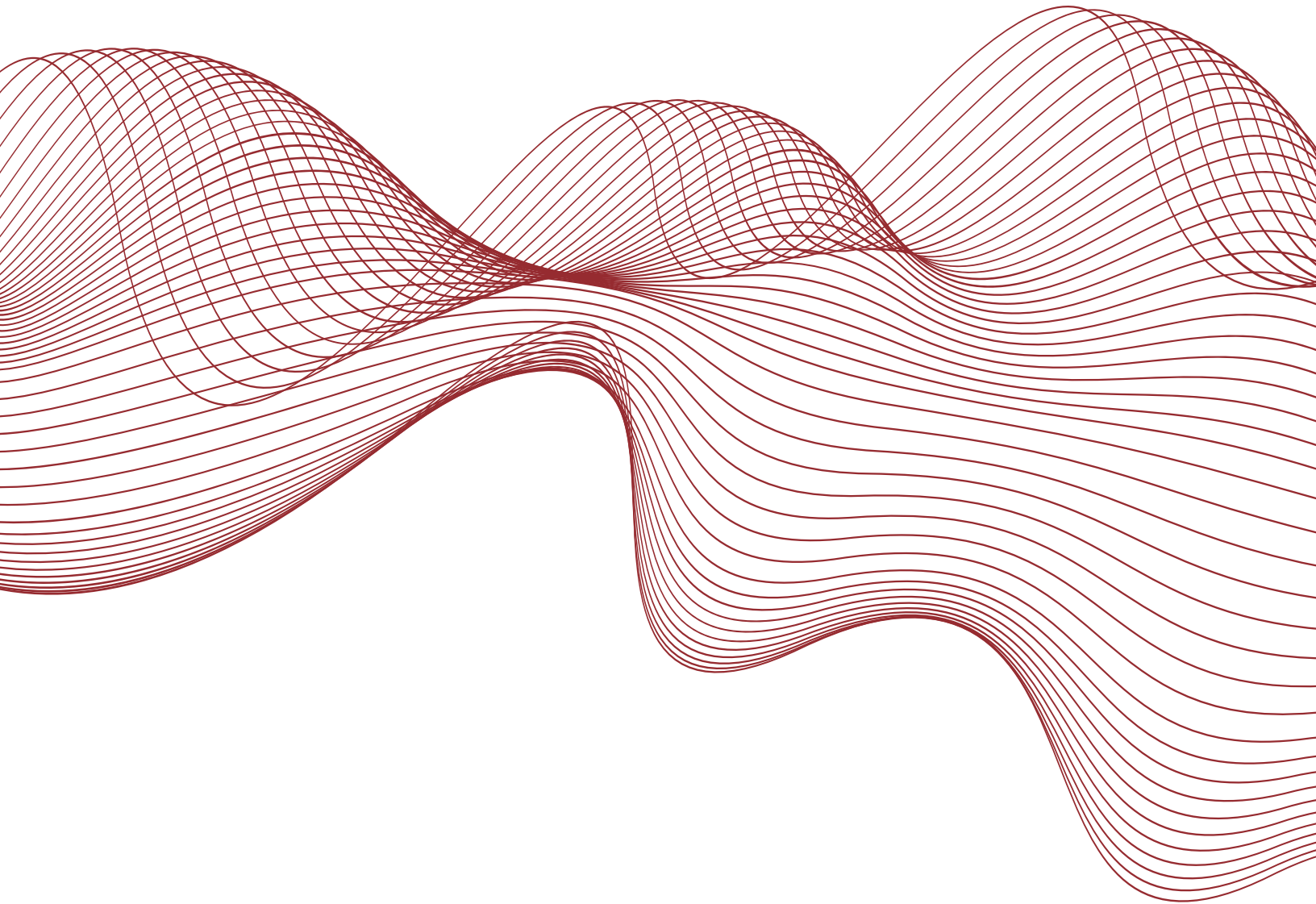
As everyone spoken to for this report suggested, telecom is changing, from the applications it can support to the tech itself and, of course, to the workers. “It’s becoming a different industry,” commented Silbert. “VR, driverless cars and transportation and the next ‘big app’ are all contributing to this.”

All of these transformations, yes, mean some things are in need of an overhaul to make sure telecom doesn’t fall behind when it comes to nabbing the much

needed and hugely sought after software developers and technicians, but it’s also an opportunity to change how telecom markets itself to the incoming workforce, a workforce that grew up with the internet and maybe just needs to be reminded that fiber is the backbone that makes so many of the things they take for granted possible, from Googling a gluten-free muffin recipe to allowing them to stay connected during a global pandemic. And just as important a reminder: Everyone is entitled to reliable telecommunication services, regardless of

income, race, geographic location or even their ROI potential for providers.

“Everything is becoming smarter, which means we need more and more connectivity,” said Carroll. “When we’re building these networks, if we build them correctly, they’ll be future-proofed and as long as people are trained and know how to do that, we’re deploying these BEAD funds efficiently.”



Featured Companies



NB+C

Founded in 1984, NB+C is a leading telecommunications infrastructure development firm offering turnkey services for the nation's 5G networks. From our four walls to the real world, we put next generation wireless within reach – offering a full scope of solutions, from early-stage project planning to engineering and construction for clients in the wireless, fiber and utility industries.

[Learn more](#)
