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EDITOR'S NOTE
by Sharon Vollman

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The Great Breakup
It Impacts ALL of Us

The "Women in the Workplace 2022" report shares important data and steps companies can take to achieve gender equity. One trend it examines is women in leadership positions who make decisions to exit one-sided relationships. It's called the "Great Breakup" and could be more powerful than we realize.

The McKinsey & Company and Leanin.Org report shares how "women are demanding more from work, and they're leaving their companies in unprecedented numbers to get it. Women leaders are switching jobs at the highest rates we've ever seen—and at higher rates than men in leadership positions." It goes on to say this could have serious implications for companies because women are already significantly underrepresented in leadership.

Women are leaving in part because our priorities differ from our male counterparts. We want DE&I, employee well-being and a work environment with less microaggression. We want to champion others—not just create the appearance of championing others.

> Whether you're a senior leader, mid-level manager or technician, remember the "Great Breakup" is a professional strategy you have at your fingertips. It's not a woman-only thing. If your professional relationship is not about the right things, it may be time to re-evaluate.

I've seen the "Great Breakup" in action across the telecom industry and I smile each time I learn another seasoned woman leader has moved to a better place in her career. Talking with some of them, we admit not advocating for ourselves in the early days of our careers. Today, we watch the young, smart professionals around us, and admire their youthful boldness. We don't think they are watching us.

The McKinsey report says they are and what we do could impact their professional choices in the future.

So, whether you're a senior leader, mid-level manager or technician, remember the "Great Breakup" is a professional strategy you have at your fingertips. It's not a woman-only thing. If your professional relationship is not about the right things, it may be time to re-evaluate.

Why? Because it's not ALL about you. It's also about those who are watching and learning from you without your knowledge. The gender-neutral quote below says it well.

"Before you are a leader, success is about growing yourself. When you become a leader, success is about growing others." – Jack Welch

Sharon

Sharon Vollman, Editorial Director

FUN FACTOIDS

Telecom is Wearing its GIS Thinking Map

According to a recent report, GIS in the telecom market had revenue of $1,564.6 million in 2021, which will increase to $4,482.8 million by 2030, increasing by 12% over the reporting period. This is attributed to high demand for network installations and the increasing acceptance of GIS to aid in deploying broadband and mobile services.

Global GIS in Telecom Market
Market forecast to grow at a CAGR of 12.4%

USD 4,482.8 Million

USD 1,564.6 Million

2021   2030
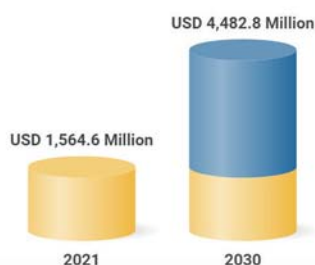
North America holds the largest GIS in telecom market share, credited to the speedy development of 5G networks. For example, Verizon Communications, Inc. is directing field experiments with its partners related to its 5G wireless network.

Source: https://www.researchandmarkets.com/reports/5128875

Parks Associates Forecast: Internet Adoption in US Households
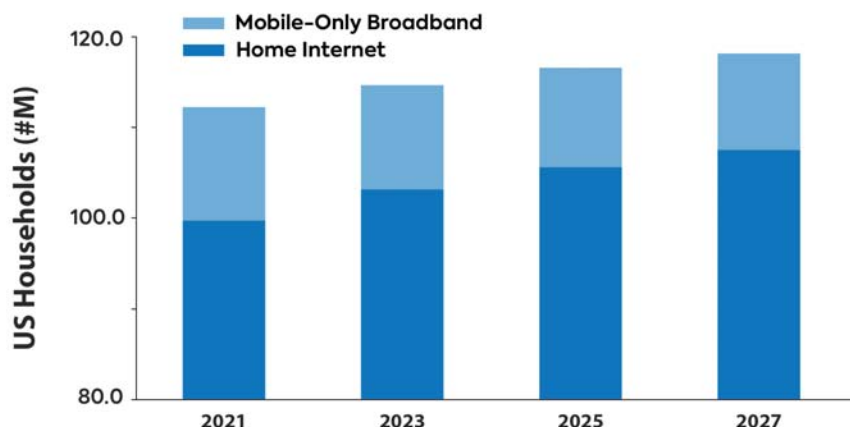
By year-end 2025, Parks Associates' research expects

93% of US households

will have a fixed or mobile broadband subscription, which is just around the corner.

Source: http://www.parksassociates.com/blog/article/10182022

FOR CRYING OUT CLOUD! TEN PERCENT ISN'T BAD...

The market size for cloud managed services is expected to grow from $99 billion in 2022 to $164 billion by 2027. That translates to a 10% CAGR according to a new report shared on MarketsandMarkets.com.

Source: www.marketsandmarkets.com/pdfdownloadNew.asp?id=195317068

SUPPLY CHAIN SIM STRUGGLES

ABI Research says the SIM card market has changed dramatically. Previous 2023 YoY growth expectations of 7.2% have now been reduced to 1.8% due to challenging macroeconomic trends. In 2022, 4.33 billion SIM cards will be shipped globally, down 8.5% YoY, as the semiconductor industry continues to be plagued by a range of impactful influences. COVID-19 challenges continue to linger, as do supply chain constraints.

Source: https://www.abiresearch.com/press/433-billion-sim-cards-to-be-delivered-in-2022-as-chip-shortage-effects-linger-and-apple-intros-esim-only-smartphones/

Not Quite a Jagged Little Pill at 28% CAGR

It's expected that the number of ePharmacy users will reach 1 billion globally by 2027, increasing from 795 million in 2022 for a growth of 28%. Juniper Research attributes this increase in adoption as a result of the COVID-19 pandemic when consumers were unable to leave their homes and turned to receiving medication through ePharmacies.

Source: https://www.juniperresearch.com/researchstore/key-vertical-markets/epharmacy-market-research-report?utm_source=juniper_pr&utm_campaign=pr1_epharmacy_technology_markets_oct22&utm_medium=email

The 45-Year-Old Overnight Sensation
Year-End Fiber Forward Learnings

FIBER OPTIC EXPERT
by Jim Hayes

For more information,
email jeh@jimhayes.com or visit
www.jimhayes.com.

To learn more about The Fiber Optic
Association, visit www.thefoa.org.
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ticAssociation, LinkedIn: company/
the-fiber-optic-association-inc-foa,
Twitter @fiberopticassoc, and
YouTube: user/thefoainc.

Jim Hayes is the Fiber Optic Expert
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since the late 1970s. He founded
one of the world's first fiber optic
test equipment companies, FOTEC,
which was acquired by Fluke in
2000, and he was a co-founder of
the Fiber Optic Association (FOA),
the international professional soci-
ety of fiber optics, in 1995. Jim is a
writer and trainer and the President
of FOA. He is the author of nine
books on fiber optics and cabling
and writes for several magazines.
Jim and his wife, Karen, who is the
GM of the FOA, have traveled the
world for the FOA helping set up
schools to train the workers who
design, build, and operate today's
communications networks. The FOA
offers nearly 1,000 pages of online
technical materials, over 100 videos,
and two dozen free self-study
courses online.

This year has been one of surprises and challenges that are often connected. Unlike years in the past, the news was not new technology or applications, it was all about funding fiber optic infrastructure projects. The US government passed the Infrastructure Investment and Jobs Act (IIJA) where one part of it, the Broadband Equity, Access and Deployment (BEAD) program, sets aside ~$43 billion to fund building broadband in unserved and underserved areas.

This one program is making waves—perhaps better to say a tsunami—in the communications world. Let's look at some of its impact on us.

The BEAD program is managed by the National Telecommunications and Information Administration (NTIA). In their announcement of the BEAD program funding, they clearly state, "With respect to the deployment of last-mile broadband infrastructure, the Program prioritizes projects designed to provide fiber connectivity directly to the end user" and "NTIA has determined that 'Priority Broadband Projects' are those that use end-to-end fiber-optic architecture. Only end-to-end fiber will 'ensure that the network built by the project can easily scale speeds over time to … meet the evolving connectivity needs of households and businesses' and 'support the deployment of 5G, successor wireless technologies, and other advanced services.'"

They are saying what we in the field have been saying for decades; wireless and DSL cannot compete with fiber optics. Now everybody is talking about fiber like it's some newfangled invention instead of a technology that some of us have been working with for nearly half a century.

Companies Die From Indigestion More Often Than Starvation

Interestingly, the total amount of BEAD spending will likely be $60 billion because it requires local matching funds. Not surprisingly, we're already seeing signs of what's coming. Fiber optic cable delivery times are long and getting longer—mostly from 5G and data centers to date. In response, manufacturers are adding equipment and building factories. Now project management must plan farther in advance to ensure components arrive on time.

We also have a shortage of qualified fiber techs, so much so that the FOA has been contacted by state agencies looking for help finding fiber optic contractors to bid on these billion-dollar jobs. With all this new funding for fiber jobs, we need to get started recruiting and training new fiber techs.

Fiber Techs Must Upgrade Credentials

The BEAD funding document also has another zinger, "Use of an appropriately credentialed workforce (i.e., satisfying requirements for appropriate and relevant pre-existing occupational training, certification, and licensure)."

With the shortage of competent fiber techs, contractors are subcontracting and sub-subcontracting to the lowest bidders. It's not a coincidence that underground damages can occur when this happens. As an example, contractors have broken gas mains twice within a mile of my office. Unintentionally, landscape contractors reassigned to underground construction jobs can easily cut buried fiber optic cables.

Today's techs can step up to the challenge and become highly sought after when they

IIJA Project Funding ($ billions)

Legend:
- Broadband ($65b)
- Roads, Bridges ($111b)
- Public Transport ($39b)
- Highway Safety ($11b)
- Energy, Power, Grid ($108b)
- Railroads ($66b)
- Water, Wastewater ($55b)
- Airports, Seaports ($33b)
- Other ($54b)
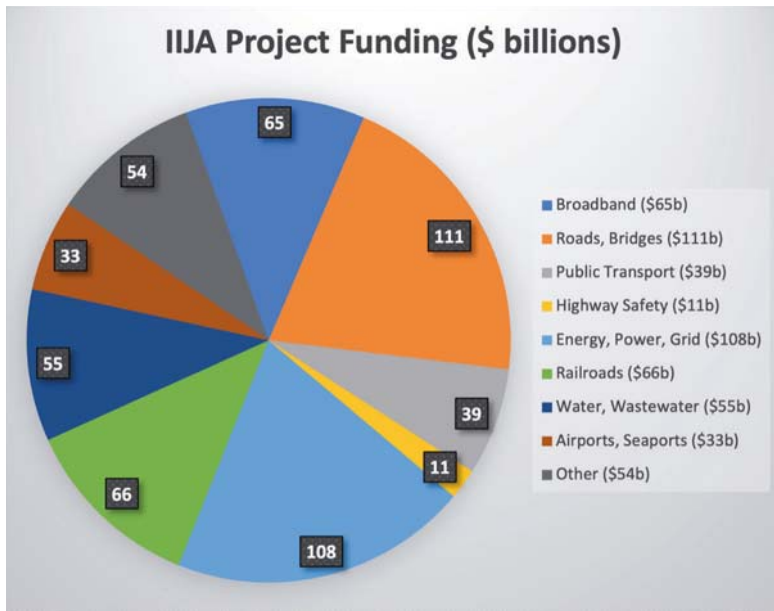
Figure 1. IIJA Funding Breakdown

> With the shortage of competent fiber techs, contractors are subcontracting and sub-subcontracting to the lowest bidders. It's not a coincidence that underground damages can occur when this happens.

upgrade their skills and get certified. Experienced techs can use the FOA's free "Work-to-Cert" program and study online to take the FOA CFOT® certification exam. Novices should take a course to learn the basics but if that's not available, they can join the FOA "OJT-to-Cert" program and study online while they learn on the job.

Thankfully, the BEAD program includes funding for training and certification. Experienced organizations like the FOA are already working with state agencies to create local training programs like the FOA did for Kentucky Wired in the Kentucky Community and Technical College System (KCTCS). This grass roots initiative recruited and trained many techs for the contractors who built the Kentucky Wired backbone—connecting all 95 counties in the state.

Our organization also works with high schools to empower STEM teachers with recruiting information about fiber optic careers. Together, the FOA and teachers can help convince students that fiber optic jobs are high tech and don't require a degree to succeed.

The Tip of the Fiber Iceberg

When BEAD was announced, we were pleased to see the recognition that broadband Internet service and fiber optics were receiving. Equally as important is the other "infrastructure" the IIJA will fund with a trillion dollars that will require fiber optics. (See Figure 1.)

Infrastructure projects that will also require fiber optics include transportation—roads, bridges, airports, seaports, railroads, and public transit systems. Fiber optics are needed for applications in energy, electrical generation, transmission and distribution and all forms of alternative energy sources—wind, solar, hydroelectric, and geothermal. And you guessed it. Fiber optics is also used in energy exploration, extraction, refining, and distribution.

Working with municipalities, fiber optics are critical for low profile applications like monitoring and controlling water and wastewater systems as well as intelligent traffic systems, security, and education.

Undoubtedly, the $1 trillion for all those infrastructure projects will add to the size of the fiber optic market. How big it will be over the next decade is only a guess. Will the market double? Triple? We don't know, but it will be big. And the impact on the fiber optic supply chain and workforce will likely be bigger than we can forecast as well.

Skilled labor is the missing piece. We need to address this as an industry in 2023. ■

Photo 148950249 © Andrey Popov | Dreamstime.com

Best of ISE's 2022 Executive Interviews

Hang With the Smartest People in the Room for a Few...

By Sharon Vollman

You know the saying, "If you're the smartest person in the room, you are in the wrong room."

Many variations of this quote have been shared to state the obvious but important message that we should surround ourselves with people who are more intelligent than we are. Or, maybe those who are equally as smart but tackle problems in different ways than we do.

But how often do we act on that message? Not as often as we should.

That's why we revisited thoughts offered from some of the super smart leaders we interviewed throughout 2022. From CEOs to boots-on-the-ground field leaders—we've snagged the best nuggets of wisdom from our 2022 executive interviews for your career-enhancing pleasure.

We challenge you to spend a bit of time letting their insights settle in your brain. Try not to skim through their insights too quickly. Sometimes lingering with different perspectives helps them simmer, gather context, and turn into something meaningful.

Topic: Vendor Collaboration

ISE: What "secret sauce" should potential vendor partners use to work successfully with the Brightspeed team? Why is it different than working with other broadband providers?

Tom Maguire, Chief Operating Officer, Brightspeed: Given newer technologies, we're looking for partners to consider "cost-plus" models as opposed to the traditional Time & Material or Statement of Work ways of conducting business.

Topic: Honesty

ISE: What is it like to work for you? (Source: Robert Sutton, author and management professor at Stanford via http://www.inc.com)

Bob Mudge, Chief Executive Officer, Brightspeed: We are not here to surprise or outsmart anyone. Tom, Chris, and I share an important trait: the burning desire to deliver on our objectives and promises. People working with us do not find us getting distracted on secondary priorities—and we don't want our people to get distracted either.

Topic: Labor Challenges

ISE: About 86% of company executives name skilled labor as the top challenge facing the industry. What are your thoughts about this?

Chris Creager, Chief Administration Officer, Brightspeed: We recognized that the industry is facing hiring and retention challenges when we first discussed our vision for Brightspeed, and we knew we wanted to be an appealing employer. Part of that appeal is our focus on building a diverse team of employees who

> " I've had to take a stand for what I believe is right—for the company I serve and for the future of our industry. In some situations, I didn't follow what industry leaders, consultants or advisors recommended as a 'safe' strategy. Playing it safe is never a guarantee of the best outcome. In my mind, if you risk nothing, then you risk everything. "
>
> —Charlie Cano

Topic: Your Take

ISE: Share one problem/challenge you are passionate about solving for the ICT Industry.

Jim Capuano, CEO, Horizon: Cost-effective make-ready—this one issue has handicapped our ability to overcome The Digital Divide! The federal and state money that is being awarded to service providers is not going to the fiber and optronics that are needed to provide broadband access. The funds are being spent on upgrading utility infrastructure. To be clear, I'm not grousing about the utilities. These upgrades are needed to ensure that the underpinnings of our broadband infrastructure are solid. Commercial power is equally critical to ensure this. My point is: why isn't there a larger initiative to improve the utility rights-of-way that doesn't saddle the broadband infrastructure provider with the cost? Much of the broadband deployment is done with private funds, and attachment costs to be on the poles have killed many business cases. Simply put, more private money would be spent on broadband deployment if not for high make-ready costs.

are fierce advocates for more accessible, inclusive, and high-quality Internet. Diversity isn't a buzzword to us; we believe diversity promotes equity in the communities we serve.

Topic: Earth-Friendly Network

Johan Ottosson, Vice President Strategy, Arelion: By taking the lead in introducing next-generation routing silicon, open optics, and open line systems, we found ways to reduce power consumption of 80-90% per bit with 80% success within our IP domain transition. We have set an ambitious migration plan that will retire eight different platforms by 2025.

Ryan Korte, Senior Director, Product Management, Lumen: Many of us were taught an important principal by our parents at an early age: turn the lights off when you leave the room. Our approach is no different in that all our compute equipment, when not in use by our customers, is fully powered down until requested. This adds time to the delivery for compute resources as the power-on checks need to occur before we can deliver to our customers.

Topic: Smart Cities and Communications Service Providers/Telecom Providers

Wade Soczka, Director of Network Construction, TDS Telecom: Transforming communities does not come without disruption and coordination. Many local jurisdictions do not have staff to handle permitting, locating, and inspection tasks in support of builds, thus slowing progress. While our goal is not to build entire smart networks, we often forge strategic partnerships with local communities, helping each other build networks in support of respective goals.

Topic: Balance

Mary Nolan, Executive Director – Network Assurance, Verizon: Your physical and mental health are everything. Understanding what a healthy work/life balance is for you is essential. It's up to each employee to establish boundaries for themselves and that differs based on the person. Climbing the corporate ladder by sacrificing yourself, your family and friends is not sustainable. The first thing you need to do is recognize what provides you that balance. For some it's long weekends, some need a week, and others need two weeks.

I know a lot of people that it literally takes them days to unplug and start enjoying their time off. I know others that find the stress of returning to a mound of work makes the idea of taking 2 weeks unthinkable. There is no magic solution for everyone. We are all unique with different needs and tolerances. Once you know what you need to reenergize, to come back to the office without feeling you compromised other parts of your life, you have found your balance.

Topic: The Great Resignation and 5G Labor Needs

Brooks Fitzsimmons, Consumer Ecosystem Health, AT&T: The labor elasticity of developers coding in common "modules" and "platforms" fundamentally is becoming a double-edged sword. It will be critical to establish robust and ongoing training, pipelines into the colleges/universities,

and public policy initiatives that incentivize skills pivots to maintain and grow the labor pipeline.

Topic: Retaining and Retraining Top Talent

ISE: The great resignation is not ending. How does your team hold onto those professionals with the most talent and the greatest work ethic when they must upskill to remain relevant to TDS? That means these team members must work their "regular" jobs and at the same time learn new skills for the future. They also desire a work/life balance. Share your thoughts about the "rub" of this reality to employers AND employees.

Ken Paker, SVP of Information and Network Technologies and CTO, TDS Telecom: I love this question because it is important for both employers and employees to recognize that digital transformation benefits both groups. We often talk about digital transformation from the employer's perspective, typically cost structure related. While that is all true, there are also significant benefits for individual employees.

Take our proactive network maintenance initiatives, for example. Those capabilities will allow our employees to offer a higher grade of service but also on a more natural schedule as opposed to being under pressure due to restoring an outage or fault.

We have seen a lot of quality-of-life improvements for our associates as we go through these transitions. Of course, they are transitions nonetheless and we must always be patient with changes. To encourage adaptation to change, we have a 100% tuition reimbursement program to help employees achieve these transitions and meet their aspirations.

Topic: The Satellite Elephant in the Room

Noah Drake, President, Americas, Telstra: Satellite services still rely on telcos for ground stations and transport, and operators regularly face barriers to market entry. These issues are often best addressed through mutually beneficial partnerships with telcos. Regardless of which technology is delivered to the end user, there will always be a need for collaboration. Embracing this reality rather than fighting it is the more logical path to long-term success.

Topic: Fiber Frenzy

Kevin Tusing, Application Engineer, Clearfield: Operators will need to move quickly to hire or contract personnel and work with them to provide the training necessary to perform efficiently. But the days of lengthy training periods over a diverse collection of products and processes are gone. Focused training on specific materials and related processes needs to be developed.

Topic: The Future

ISE: What emerging or disruptive technology excites you the most for the ICT industry? Why?

Martha Suárez, President, Dynamic Spectrum Alliance: Spectrum sharing is the overarching technology that excites me most for the ICT industry. As the potential of Wi-Fi 6E and 5G emerges, this is how new applications will develop, and how underserved populations will have their connectivity needs met.

While Internet demand and usage surges, spectrum is a finite source. It is not a material that we can just find more of or dig up out of the ground, which means we must find new ways to make our usage more efficient, in ways that allow for innovative technologies. The foundation of which is based in legislature and regulation.

Topic: Your Passion

ISE: Share one problem/challenge you are passionate about solving for the ICT Industry.

Ben Goth, Vice President of Network Services, TDS Telecom: At TDS Telecom, we are passionate about driving change to deliver fiber to as many customers as possible. We are striving for changes and process refinements at every level in the fiber ecosystem to make enabling as many customer connections as possible faster. Solutions developed and commonly used in high density fiber builds do little to help enable customers in less dense areas with fiber. The designs and traditional build methods must be changed to reduce complexity and decrease the cost and time to implement fiber solutions. We must repeatedly look at every step in the process, questioning how it is done and why it is required to find opportunities for efficiencies.

Topic: Proactive Network Management

ISE: What are some proactive approaches you recommend to control OpEx?

Troy Johnson, Vice President of Network Engineering, Consolidated Communications, Inc.: Some of the proactive measures to control OpEx include constant partnership with vendors so that there is an understanding that we need to be successful together. There have been recent trends with vendors to create a more sustainable revenue stream through licensing and maintenance, which is understandable, but it needs to make business sense for all sides. Strong partnership and collaboration are key to finding agreements that work for everyone.

And of course, another focus is around migrations away from older technologies that require focused resources to maintain and either one-off maintenance agreements or sparing arrangements that are outside of our growing technology set.

Topic: Tech Talk

Joshua Seidemann, Vice President Policy and Industry Innovation, NTCA –The Rural Broadband Association: …instead of focusing solely on how many miles of fiber are deployed, or how many locations are served (both important metrics), let's also look at the ROI on rural broadband in terms of how many students realize broader opportunities through remote learning and distance education; how many patients enjoy better health outcomes through telehealth; and how many businesses and workers participate in a truly global marketplace. Broadband has an exponential multiplier impact for individual and community benefit. It is Metcalfe's Law on steroids.

Topic: Energy

ISE: If energy were free (and we're not talking power), what would your team do differently?

Kevin McDorman, Vice President, Customer Care, AT&T: Thinking more broadly from the context of my team, imagine a world with no constraints. No limiting factor of time or budget. If energy is free, we have unlimited resources at our disposal. In this world, technologies and capabilities rapidly enhance, unlocking the art of possible for people everywhere. Friction in service no longer exists and we achieve instantaneous operating capacity. Data systems have iterated and transformed to a point where insights are known as they are occurring.

Zooming back into my team, we would leverage this velocity of data and process to effortlessly identify opportunities and solve with agility. With complete, data-stitched stories available to us in real-time, we would take the optimal path towards solutions that maximize the experience of every team member and, in turn, every

customer. If energy were free, we achieve seamless collaboration, ideation, implementation, and execution.

Shifting back to the world we live in where energy is not free, our task is to optimize with what we have to come as close as we can to the effortless end state previously described. This requires constant attention towards our north star and our agreed-upon guiding principles as we journey in that direction. It takes trust, grit, and a willingness to adapt so that we can still get to where we set out to be, despite any obstacles or resource constraints that come our way. Most of all, it takes the collective vision of what that seamless, unconstrained world looks like, so we can strive for something better than where we were yesterday.

Topic: Silos
ISE: How has your team removed silos and barriers?

Johan Ottosson, Vice President Strategy, Arelion: One of our Objective and Key Results (OKR) for next year is to improve problem and incident management quality. This is a team effort, including a new network, operations center, refining customer support processes and a centralized IT project innovating new inventory and service impact analysis systems to empower teams with a shared understanding of the same data. This requires sales input on customer pain points. Collapsing silos is a journey, but we are definitely progressing.

Topic: Honesty
ISE: How much of your success comes from luck or coincidence versus grit and perseverance?

Brooks Fitzsimmons, Consumer Ecosystem Health, AT&T: I've been listening to Deepak Chopra's book, *Abundance*, and the question posed reminds me of the abundance mindset. Dr. Chopra said, "Good luck is opportunity meeting preparedness." Put simply, you and your teams could be plowing forward with grit, gumption, perseverance, and diligence, but if you can't lift your collective heads up to be mindful and receptive to the opportunities around you, you'll miss them.

I've encountered this a lot in my transformation roles. Oftentimes there is abundant "fuel" for change, including technologies, engineering, talent, and customer needs, but lacking the "spark" of mindful receptiveness, those coincident opportunities could remain dormant. Net, net, be ready for those "luck" or "coincidence" moments, so you may manifest them into "good luck" and "fortuitous coincidence" successes.

Kevin Tusing, Application Engineer, Clearfield: Throughout my career, some of the best engineers, managers, directors, officers, and executives have been those with the drive to be the best, who sought to absorb knowledge from others, and who retained it.

Some who have also stood out as exceptional had little or no formal higher education yet were the best I ever had the privilege to work under. Generally, those who came from the field got the respect of the employees under them, they knew how to speak the language and relate to what the technicians were saying.

In the military, it was about being a team and relying on the person next to you. We need to focus on building true teams from within our companies.

Topic: Risk
ISE: What's the biggest professional risk you've taken?

Charlie Cano, General Manager and CEO, Etex Telephone Cooperative: There are times in my professional career I had to take a stand for what I believe is right—for the company I serve and for the future of our industry. In some situations, I didn't follow what industry leaders, consultants or advisors recommended as a "safe" strategy. Playing it safe is never a guarantee of the best outcome. In my mind, if you risk nothing, then you risk everything.

My risks are not always the most popular moves but taking risks for what I believe in is exactly what has and what will continue to advance my team and this industry forward. ∎

Telecom Year in Review and Look Ahead to 2023

By Ken Quaglio, Chris Cortellini, and Abhay Kumar

The US telecommunications industry continues to be a dynamic one, as we saw all throughout 2022. As with every industry, telecommunications were affected by global challenges like inflation, supply chain disruptions, and labor shortages.

To start this year-in-review, we'll look at some 2022 trends on a high level. We'll then dive more in-depth around the ramifications of these trends for telecom companies' consumer and business customers as well as some considerations for infrastructure companies. Finally, we'll look ahead to our expectations for 2023.

2022 Trends

There are a few trends we saw across the entire telecom industry in 2022 that are worth noting, namely:

- Supply chains appear to have held together better than those in many

other industries due to aggressive negotiations with suppliers and a willingness to forward buy.

- Labor costs continue to rise due to high competition for field labor as fixed broadband is seeing rapid buildouts due to government funding for suburban and rural broadband services.
- Average revenue per user (ARPU) growth for the year was in the low single digits, beating pessimistic predictions that it would decline.
- The demand for video via wireline and satellite continues its slow but steady decline while the battle for control of the streaming gateway heats up.
- Telcos continue to make environmental, social, and governance (ESG) commitments, especially around greenhouse gas emissions and waste reduction. Most major operators report their Scope 1 (direct) and Scope 2 (indirect) emissions, and also attempt to calculate their Scope 3 (supply chain and other indirect) emissions. For example, AT&T continues to find new partners for its Connected Climate Initiative, which has been working to drive connectivity solutions that help reduce emissions; Salesforce joined the effort this year.

In the wireline world:

- Fiber broadband continues to attract heavy investment capital, and companies in this market continue to see valuations of 16x to 20x EBITDA.
- The enterprise segment for telcos continues to suffer a secular decline in revenue due to a shift to lower cost software-defined networking and increased competition from hyperscalers, software companies and system integrators.
- Cable broadband growth flattened in the second half of the year, though wireless add-on services are booming.

Different sectors within wireless and satellite are seeing varied results:

- The competition for 5G business solutions between telecos and system integrators is hot, but 5G has yet to deliver a viable commercial model.
- FWA broadband is just getting going, but even with 5G FWA rolling out it may not have as large a market as originally thought based on low adoption rates to date and competition from wireline.
- Satellite-based Internet service providers continue to lose subscribers, and these losses may well accelerate as more people in rural areas have their homes passed by wireline broadband providers. In August, the FCC rejected Starlink's application for nearly $1 billion in Rural Digital Opportunity Fund subsidies, citing doubt that Starlink could deliver the required services and questioning whether many households would purchase a $600 satellite receiver to use the service.

As for players in the infrastructure space:

- Infrastructure businesses are seeing a double-digit compound annual growth rate.
- Open radio access network (O-RAN) technology is reducing network hardware costs and opening a new era of software-defined networks.
- As businesses continue to look to add cloud-based services, communications service providers (CSPs) need to partner with, or directly compete with, hyperscalers.
- TowerCos are delivering financial returns superior to those of the telecos that first built most towers.

Consumer Market Ramifications

All CSPs have two needs in common: subscribers and infrastructure. The quest to add and retain subscribers drove much of the activity we saw in

Illustration 57181805 © Scanrail | Dreamstime.com

2022 and will likely do so again in 2023. Low rates of household formation and population growth mean that adding new subscribers requires taking share from someone else. In wireless, T-Mobile has been gaining over AT&T and Verizon, though aggressive promotions have allowed AT&T to see consistent improvement in net adds overall. In FWA, the race is primarily between T-Mobile and Verizon, though FWA's contribution is currently minor compared to the rest of these companies' offerings. In wireline, fiber builders are

> FWA broadband is just getting going, but even with 5G FWA rolling out it may not have as large a market as originally thought based on low adoption rates to date and competition from wireline.

passing homes as quickly as they can to capture migrations from copper, provide new services to underserved markets, or offer an alternative to cable.

Cable operators continue to add wireless subscribers as part of a converged offering. As broadband subscriber growth has slowed, they are reinvigorating their edge-out strategies and selective overbuilds. Satellite remains a bit of a losing proposition, with the addressable market shrinking as subscribers move to faster, more affordable solutions. The promise of low-earth orbit (LEO) broadband from players like Starlink has yet to materialize at scale. And all this is before the Infrastructure Investment and Jobs Act's (IIJA) promised Broadband Equity, Access, and Deployment (BEAD) money starts to flow to wireline operators who can offer higher speeds at a lower price than satellite.

This last point has led to an acquisition/investment frenzy in fiber broadband providers. We have seen EBITDA multiples of 16-20x and higher for companies that are valued on a discounted cash flow basis with assumed subscriber

penetration rates. While the market generally looks at homes passed as a proxy for future earnings, conversion to paid subscribers remains key. There is rising competition from FWA providers with bundled plans like T-Mobile and Verizon at the edges. Incumbent cable operators are getting more aggressive in defending their markets as well by pushing fiber further out, preparing for DOCSIS 4.0 technology, and edging out to serve new customers. The bottom line is that we may soon be reaching market saturation for broadband.

While all of this is going on, cable operators are bundling wireless service into their broadband offerings at an attractive price. The success of this strategy is proven by the sheer number of new subscribers announced each quarter. These bundled plans tend to be sticky with consumers and very accretive for the operators. Today, they offer these services as mobile virtual network operators, but will increasingly shift service from the wireless wholesaler to their own networks using Wi-Fi and CBRS spectrum, becoming mobile network operators using their own capacity with marginal incremental costs.

Further complicating the picture is the continued loss of revenue-generating units tied to video as TV subscribers continue to cut the cord. While this suggests that streaming services are increasing their subscriber bases, we're starting to see a leveling off there. This may be due to inflation concerns, but it also may have something to do with the increasing complexity and cost consumers face with many streaming services to choose from. Aggregators are trying to make a play in this space by building a simple IP gateway to content, including Roku, Amazon, and Apple, as well as DirecTV, Flex (a Charter-Comcast joint venture), and some software-based providers. At the same time, there are growing partnerships and integrated offerings, such as smart TVs with integrated operating systems based on

Amazon Fire TV Stick and Roku technology. We'll see more "frenemies" coming together to attack joint problems with scale solutions.

Business Market Ramifications

Utilities have traditionally enjoyed steady revenue from their business accounts, but in telecoms this share of spend is under increasing pressure. Business customers that were on copper increasingly have an alternative in the form of cloud-based solutions. Small and mid-size businesses have a variety of options to shift to cloud-enabled services from hyperscalers like Amazon, Microsoft, and Google.

For CSPs, this is both a threat and an opportunity. The threat is that these customers will find they can live without CSPs. CSPs can partner with the hyperscalers to take advantage of the network through edge to cloud-based services. While it's early, this holds the promise of new services/capabilities to support the Internet of Things (IoT), autonomous operations, and security.

A sum of $1.5 billion for O-RAN was included in the CHIPS and Science Act of 2022 to fund the Public Wireless Supply Chain Innovation Fund to increase supplier diversity in the mobile networks sector. This funding is intended to accelerate alternatives to Huawei by creating software-based open network architectures that are less dependent on hardware interoperability from a single supplier, opening the door to lower cost, more flexible mobile networks.

Wireline broadband supports some 90% of all Internet traffic. For this reason, infrastructure providers like Equinix, Digital Realty Trust, Zayo, and Level 3 are seeing solid continued growth and opportunities. TowerCos also continues to see solid growth as 5G carrier deployments remain strong and the churn from Sprint is largely worked out.

Looking Ahead to 2023

So, what do we expect to see happen in 2023? To start, the demand for data will continue unabated as the average consumer's usage will continue its rapid rise. To meet demand, the government-fueled fiber buildout throughout the suburbs and rural areas will continue, with early-subscriber success becoming increasingly important.

Players will continue to battle for broadband and wireless subscribers, while cable operators will continue to aggressively offer wireless bundles as add-ons. These same cable operators will also start to migrate wireless customers to their Wi-Fi and CBRS networks. Wireline companies will increasingly turn to edge-outs for revenue growth.

We anticipate that FWA will realize a limited addressable market and become a niche offering as a lower cost alternative to wireline or a fill-in service as an edge case in select rural markets. 5G mobile broadband buildouts will continue and may well lead to a renewed focus on small-cell deployments. As more geographies gain access to wireline, satellite will become the ISP of last resort. CSPs will see ARPU remaining relatively flat or perhaps even decline slightly for wireline customers, and possibly for wireless as well if T-Mobile continues to hold the line.

Wireless companies will continue to try to protect their margins against inflation and increasing labor costs. They'll also look for alternate sources of top-line growth in areas like network as a service (NaaS) and use-case specific platforms like the IoT.

In the business customer arena, 5G may start to present some viable commercial use cases while commercial wireline will continue to decline for myriad reasons ranging from competition from tech companies to new technologies to a continued decline in demand as fewer and fewer Americans work from dedicated employer sites. Finally, technology will continue to create new business opportunities; we expect to see O-RAN find a foothold, DOCSIS 4.0 to emerge as a viable alternative to fiber, and new use cases for edge computing to be found.

Elsewhere, we expect to see streaming services continue to experiment with both content and distribution, with aggregators emerging to simplify the consumer experience. The IoT should see increased consumer adoption around smart home technologies and expand in the industrial world as part of the ongoing movement to adopt Industry 4.0 practices. ∎

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▼ Show day opens with attendees and vendors eager to learn from the best and find solutions to their network pain points.


▲ Executive Roundtable participants (left to right): Michael White, Congruex; Randall René, Esri; Annie Bogue, Fujitsu; Dan Levac, PLP; Sam Pratt, Render Networks; and Joe Jensen, Corning.

▲ Hole in one or just having fun? Exhibitors and attendees hit the links and celebrated making new connections during their casual time on the Wellshire Golf Course in Denver, Colorado, prior to the exhibit floor opening.

▲ Ken Paker, SVP and CTO, TDS Telecom, motivated and inspired attendees with his Opening Keynote presentation. **To view the Keynote and Tech Talk presentation videos, go to: https://isemag.com/14283953.**
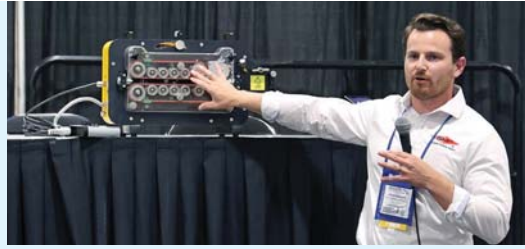
Demo Zone presentations by Guillaume Lavallée, EXFO; Jimmy Perdue and Justin Nagle, VIAVI Solutions; Josh Leeds, PLP; Brian Rodgers, GMP.

▶ Michael Zammit of Go!Foton shares the latest optics and photonic market innovations that help solve real-world problems facing CSPs with Janice Oliva, VP, Group Publisher Lighting & Technology.

▲ Kevin Morgan, Clearfield, presents "Fiber Technology & Industry Trends" seminar on behalf of the Fiber Broadband Association.
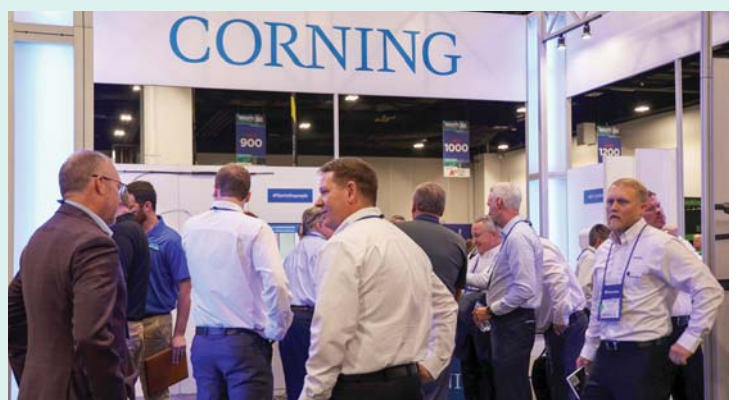
The exhibit floor was buzzing with activity as seen here at the Clearfield, Corning, and OFS booths.

▲ ICT Visionaries including Kevin Tusing, Clearfield; Wade Soczka, TDS Telecom; and Ryan Korte, Lumen, shared lunch, and ways to problem-solve network pain points in a closed-door roundtable lunch at the Capital Grille.

Closing Keynote Tech Talks presentations given by Kevin McDorman, VP, Customer Care, AT&T; Troy Johnson, VP of Network Engineering, Consolidated Communications, Inc.; Joshua Seidemann VP Policy and Industry Innovation, NTCA-The Rural Broadband Association; and Ben Goth, VP of Network Services, TDS Telecom.

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▲ Brandon Quesenberry, Citizens Telephone Cooperative, jumps for joy after winning the attendee vacation giveaway. Or perhaps he's just THAT excited to attend ISE EXPO! Sponsors of the giveaway include Communication Network Engineering, Craftmark Cable Markers, Genuine Cable Group, Milwaukee Tool, MOUNTAIN, LTD., Powerline Hardware, Quest Controls, R&M USA, Rainbow Technology, and Wirewerks.

Phase Two of Fiber Transformation Starts Now

By Tom Starr and Mark Fishburn

The imperative to reach and empower broadband for gigabit services is well underway but its impact is just beginning. Most easily reached areas were covered by Phase One of fiber rollout. Up to now, the rollout picked the low hanging fiber fruit to access a small and often privileged minority of homes in conveniently placed locations. What remains now are areas where building fiber-only access is difficult to financially justify.

What has been missing is the ability to extend gigabit capabilities to a new stratum of customers that cannot be affordably reached with this fiber-only strategy. This has been an historical problem with providers struggling to recover the cost of fiber installations. In the past, they have lacked decent alternatives that are too costly and have lengthy install timelines.

Phase Two is based on a generation of hybrid-fiber solutions that can reach millions more

end-users—making high-speed broadband affordable for users while avoiding daunting provider installation costs and lengthy delays of new construction. Phase Two combines fiber and new copper technologies to deliver gigabit class services.

This second phase of fiber transformation can enable new economic growth by connecting those who are not currently served in the distributed workforce, multi-tenant businesses, multi-dwelling buildings, and homes. It can also pave the way to upgrade existing broadband connectivity in line with new higher speed FCC broadband requirements. Finally, it can help fulfill the U.S. government's funding intentions to reach underserved communities.

This article reviews the latest technologies that can deliver hybrid gigabit services with significant cost savings to a much-extended range of customers. It concludes by summarizing the connectivity and commercial impact of Phase Two.

If This Is Phase Two, What Was Phase One?

The U.S. Census Bureau[1] estimates there will be growth to 132 million households by 2022 as shown in Figure 1. According to the well-covered study[2] published in 2022 by the Fiber Broadband Association, fiber has reached about 43% of these (60.5 million) with only 24.3 million actually directly connected to the Internet via fiber. The question is why and what can be done?

Providers have done a great job of deploying fiber to the neighborhood, a.k.a. "homes passed" but not into actual "homes served". Realistically, the policy of taking fiber-to-the-home is too expensive.

> The notion that only fiber can support modern, gigabit service is not valid. Options for transmission over the short copper wires to the home include: MGfast, G.fast, G.hn, and MoCA.

Phase One led with the assumption that fiber-only was the approach providers should take. Phase Two dispels that fallacy. What's new in Phase Two are the latest copper gigabit standards and secured communication technologies highlighted in Figure 2.

Technology Options for Fiber Transformation Phase Two

The notion that only fiber can support modern, gigabit service is no longer valid. Options for transmission over the short copper wires to the home include: MGfast, G.fast, G.hn, and MoCA. The current hybrid-fiber technologies that can deliver secure, gigabit services are on the next page.

Phase One Fiber Transformation — ~132 million U.S. Households →

Fiber Homes Passed		Existing Broadband mix of lower speed connections	Unserved outlying & Rural
Homes Connected	Passed but Unconnected		
24m	35m	55m	17m

Figure 1. Phase One has thus far only connected 20% of households.

Phase Two Fiber Transformation — ~ 132 million U.S. Households →

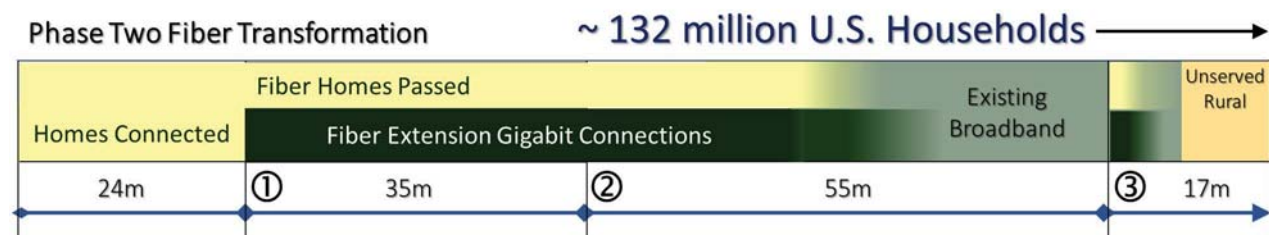| Fiber Homes Passed			Existing Broadband	Unserved Rural
Homes Connected	Fiber Extension Gigabit Connections			
24m	① 35m	② 55m	③	17m

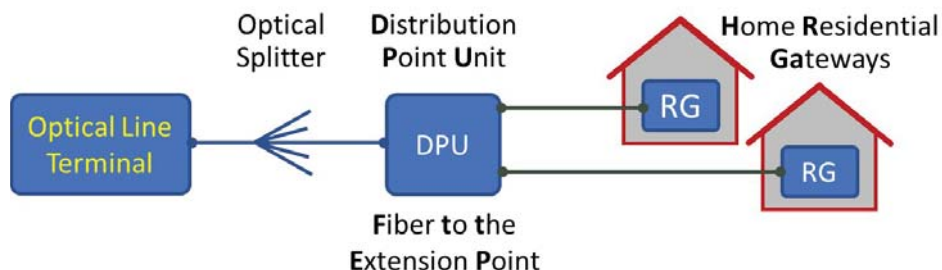Figure 2. Potential for connecting 75% of households.

Figure 3.

FTTep

In many places, building fiber cable is very expensive, especially in the last segment. In these situations, using existing coax or phone wiring to reach the last few hundred feet is a much more practical and cost-effective approach. Broadband Forum TR-419 describes Fiber-to-the-Extension-Point (FTTep) as a variety of technologies that can carry gigabit service over existing wires to each home at a cost far less than Fiber-to-the-Home (FTTH). (See Figure 3.)

In these cases, the network Distribution Point Unit (DPU) multiplexer is usually located near customer homes. It uses fiber backhaul to the exchange, and copper-transmission technologies such as G.fast to carry gigabit service the last few hundred feet to homes. However, if fiber backhaul from the DPU to the exchange is not feasible, the DPU backhaul can be achieved using G.fast technology over existing telephone wires.

ITU-T standard G.9702 (G.fastback) was approved in 2022, specifying DPU backhaul by bonding multiple G.fast lines, typically up to 16 lines and allowing backhaul speeds to 10 gigabits and beyond. Thus, the existing telephone wires can be utilized on both the network-side and customer-side of the DPU. Furthermore, the backhaul reach can be extended to nearly a mile by installing line-powered, mid-span amplifiers. This extends the FTTep concept of using fiber where it makes sense and use the existing copper wires to reach where fiber cannot, including power over copper when none is available. (See Figure 4.)

MGfast

ITU-T standard G.9701 for G.fast specifies transmission up to 2 Gb/s over telephone wires, coax, and Ethernet cables up to 1,500 feet. Dynamic Time Assignment enables G.fast lines to automatically reallocate the transmission capacity
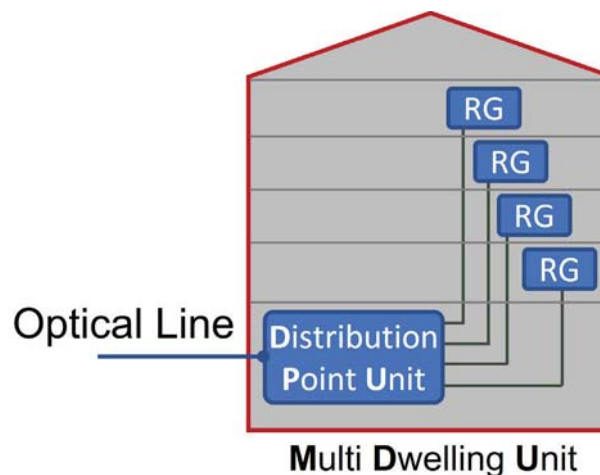
Figure 4.

between the downstream and upstream directions in response to the customer's traffic to support gigabit data rates in either direction.

ITU-T Standards G.9710, G.9711 and G.997.3 specify MGfast, the newest copper wire transmission technology. Using full-duplex transmission up to 424 MHz, MGfast can achieve an aggregate bit rate up to 10 Gb/s on coax and CAT 5e/6 wire. On traditional telephone wires, MGfast can exceed the maximum bit rate of what is already achieved by today's G.fast technology (2 Gb/s). Like G.fast, MGfast can operate on wires up to 1,500 feet.

G.hn

ITU-T standards G.9960 and G.9961 for G.hn specify transmission up to 10 Gbps over coax (using a bandwidth of 2 GHz), and up to 3 Gbps on telephone and Ethernet cables (using a bandwidth up to 400 MHz). G.hn can operate over wires up to 1,500 feet. What's new is that G.hn may now be used for access from the DPU to the home, especially with the new "Vector Boost" technique that enables G.hn to operate in multipair telephone cables by avoiding crosstalk between the wires. As with MGfast and

G.fast, G.hn can carry the gigabit service over wires within the premises as well as to the home.

MoCA

MoCA Access 2.5 provides 2.5 Gbps downstream, 2.0 Gbps upstream over coax wires, supporting point-to-point and point-to-multipoint over a distance up to 500 feet.

FTTH

The new ITU-T G.9804 50G-PON will soon provide up to 50x50 Gbps FTTH. The fiber PON capacity may be shared by up to 32 customers, to provide service speeds from 300 Mbps to 5 Gbps. FTTH has been the default way to connect homes and offices to the Internet at gigabit speed.

ITU-T standard G.984x specifying 2.5x1.25 Gbps GPON has been widely deployed, and now G.9807.1 XGS-PON is an increasingly popular way to provide 10x10 Gbps FTTH.

Impact of Phase Two: Affordable Connections for Millions More Households

- From the market segmentation shown in Figure 1, hybrid gigabit services have the potential to connect 35 million new gigabit households yielding provider revenues in the order of $25 billion per year. Figure 2 shows that Phase Two can greatly help speed installation with accompanying reduced costs.
- These offerings also incent providers to upgrade existing broadband services to gigabit performance using new hybrid fiber for their current customers. Figure 2 also shows that using these copper technologies could enable an additional 25-40 million households in network upgrades.
- These solutions could help providers deliver on the commitments they must make to receive portions of the $65 billion from various U.S. federal grants. These monies are intended to reach the majority of the 17 million underserved subscribers in target communities and there will be significant oversight across the life cycle of this program. Phase Two will enable far more households to be connected for the same funding in these areas.

These three areas of growth will take time, of course. In addition, not every remote area providers'

aim to serve may be reachable via terrestrial means. However, Phase Two is a big step toward enabling lower cost connectivity, economic business, and provider opportunities.

Thankfully, products and services are available today to capitalize on this opportunity. Several vendors provide equipment supporting Phase Two hybrid fiber access. One example is the Actelis hybrid fiber equipment that was featured in the winners of the recent IEEE ComSoc award[3] for products to help end the digital divide. For full details on the Actelis range of hybrid fiber products, visit www.actelis.com.

This year has been a transformative year in thinking about how billions of dollars in government funding can be well spent. Perhaps over the next few years, this thinking will translate into fruitful actions that help the "digital divide" become a distant memory. One that exists only in the history books. ∎

REFERENCES AND NOTES

1. U.S. Census Bureau: https://www.census.gov/quickfacts/fact/table/US/HCN010217
2. Fiber Broadband Association: https://www.fiberbroadband.org/blog/fiber-broadband-enters-largest-investment-cycle-ever
3. IEEE ComSoc Award: https://actelis.com/actelis-to-win-1st-place-for-na-in-ieee-comsoc-internet-for-all-competition/

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Does Your Company Really "Get" Safety?

What's Your YE Safety Status?

By Carl Potter

In the past 30 years we have come a long way in creating safe workplaces in the United States. The numbers are better in some ways, but we still have lots of work to do. When I am presenting to a group, the audiences find it appalling that in 1992 it was not unusual for a company of 4,000-5,000 employees to have a goal of 35-40 OSHA recordables annually. About that time, the industry was challenged with the goal of zero OSHA recordables and to say they were skeptical is an understatement. One such conversation in 1992 went like this:

A client called and asked, "Can't we just hire a contractor to do the high-risk work, so our employees are not at risk?"

"So, you would be willing to allow a contractor to kill or injure an employee to get the job done?"

"Well...since you put it that way...that doesn't sound good..."

This was the beginning of my passionate cry to set a goal of zero through responsible safety management. For many, it was a paradigm shift because they believed that zero OSHA recordables was impossible. During this time, it took a lot of discussion to convince senior management to put the resources in place to make this happen. When presented with the plan to create a consistent process for reducing the risk to injury, many got excited while others waited to see if this was a fad.

Today we would be disgusted by a company that believed that injuries and death are just part of industry. New safety applications for computers and smart phones abound, not to mention the wearable safety garments and devices that stop deaths and reduce injuries on the job. Safety processes that include safety committees representing cross sections of organizations are created. Meetings are held to share concepts for mitigating hazards and awards are handed out for those who "get safety" at the highest level of the organization. All of this is an evolution of safety that continues and will continue as long as people are exposed to work situations where they can be killed or injured.

So, what is the common thread that runs through the industry from 1992 until today?

Being responsible and doing what is supposed to be done to mitigate hazards and guarantee no death or injury is still the challenge. It is as old as the

blame game gets. Unfortunately, blame is a human trait we all share at some level. Nobody wants to be the reason for their own injury or the injury or death of another human. The real trick is getting people to accept responsibility by holding them accountable for what they commit to doing.

I have spoken at many companies where they hung a banner with a cool logo and theme stating, "I am responsible!" that everyone attending signed. The problem is that getting everyone to truly accept responsibility and understand it takes more than just a Sharpie pen to demonstrate commitment. Workshops where time is spent in conversation to pursue understanding takes resources that most companies struggle to provide. I have had my share of conversations with someone hiring me that asks, "Can you get this done in 30-45 minutes? We have a lot of technical stuff to cover from HR and Safety, and we have to show them how to fill out request forms on the computer in 4 hours." Really?

Changing a work culture to believe that every injury or death in the workplace is preventable takes commitment at all levels. You cannot just say, "Let's do this…" and expect to hit the mark. First comes the target, then comes the reflection, and then comes the plan, followed by the action.

> Nobody wants to be the reason for their own injury or the injury or death of another human. The real trick is getting people to accept responsibility by holding them accountable for what they commit to doing.

When I am working with a company, the first thing I discuss with leaders is their vision for safety. What are the results they would dream of achieving? Then we begin to identify the company's "current state of safety". Confirming the current state is usually my job since nobody can really "see" what needs to be "seen" like a third-party can. Many times, my report is a shocker and sometimes managers and executives deny what is found. The leaders that really want improvement are the ones who "get it" and say, "What's next?"

Then I say, "Let's visit your dream results and establish what you want the future state of safety to be in your organization". Once we establish the future state then we begin planning and developing continuous improvement tools. Interestingly, I always see excitement and energy that was not

evident before we started. The result is reduced risk and most of the time increased production. When you think about it, it just makes sense!

If your organization is wondering where to take safety in the next 12 months just get together and ask, "Where are we today, and where do we hope to go from here?" It's not a bad place to start. The companies I work with now are encouraged to not just target zero OSHA recordables but, "Create a workplace where it is difficult to get hurt". This is done by creating an environment of trust where everyone is willing to take responsibility for safety. When this is accomplished and the discussions continue, the result is a workplace where nobody gets hurt. ∎

ABOUT THE AUTHOR

Carl Potter is a certified safety professional and certified management consultant who has consulted to the industry for over 30 years. He has authored 8 books and countless articles. He is a sought-after conference speaker and consults to a variety of industries to help them achieve workplaces where it's difficult to get hurt. He may be reached at www.carlpotter.com and you can follow him on LinkedIn: https://www.linkedin.com/in/safetyspeaker/.

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Can Innovative Approaches Help Tackle Telecom Talent Shortages?

From multi-stake collaborations to new education programs, the industry is pushing hard to both attract and keep talent.

By Adrienne Selko

"This problem is not insurmountable.

It's going to take time to remedy the issue, but there are very logical steps that can be taken, and we just have to find more opportunities to take these steps."

This is **Josh Seidemann's** viewpoint—a fairly optimistic one at that—as to how the industry will need to address the talent challenges. Seidemann is Vice President Policy and Innovation for NTCA-The Rural Broadband Association. The association represents 850 independent, family-owned and community-based telecommunications companies that deliver broadband connectivity in rural and small-town communities across the US.

Jim Hayes, President of The Fiber Optic Association (FOA), isn't quite as hopeful. "Looking at the Inflation Reduction Act for 2022, which includes $40 billion in new funds to rebuild infrastructure all of which will involve optical fiber, it represents a doubling of the amount of work that is being done now. Who is going to do this work? We are already short of workers. No one is ready to answer this question."

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Hayes elaborates on this point reflecting on a call he received a few months ago from a state office that was overseeing a bid for a multi-billion dollar project involving fiber optics. "They asked us if we could find more contractors to bid on the jobs as everyone is so booked up that they were having a hard time getting people to even bid on jobs."

While each of them approaches the workforce shortage from a slightly different perspective—Seidemann serves the rural market, while Hayes focuses on broadband for underserved areas—the one thing they agree on is the importance of not reinventing the wheel, as the expression goes. There are programs already underway through public/private partnerships that are addressing all aspects of the talent shortage.

> Training is essential, but retention becomes even more important. "Once you have the talent in your company, how do you make sure they will stick with you?" asks Josh Seidemann, Vice President Policy and Innovation, NTCA-The Rural Broadband Association.

Sorting Out the Issues

Before we talk about those, let's examine some of the underlying factors that are causing the talent shortage in the industry.

"In the rural communities, there is somewhat of a brain drain," says Seidemann. "A lot of the best and brightest kids in the rural community eye the big city as a place to build a career. However, that's not the whole picture since there are a lot of people who like where they live and want to stay."

The issue for companies, notes Seidemann, is how much they are willing to put into training someone who might leave. "If you train a network technician properly so in a few years they have acquired tremendous skills, they might decide that they could be making more money in a larger city and leave."

Of course, that is a problem all companies face as talent moves around a lot more than it used to. As the expression goes, "What if we train them and they leave, or what if we don't train them and they stay?"

Training is essential, but retention becomes even more important. "Once you have the talent in your company, how do you make sure they will stick with you?" asks Seidemann. One way to increase retention is to pay attention to the needs of the current workforce. Seidemann gives this example. "A general manager of a small company at our conference said that one of his department managers was having an issue with a worker. The employee said his child plays baseball on Thursday nights and so he wants to structure his work schedule so that he can leave work by three to see him play. The general manager said he should do it. 'We sold ourselves to employees as being family friendly, so we have to put our money where our mouth is.'"

Keeping close to the image that the industry has portrayed is necessary and seems to be working. According to the 2021 Randstad Employer Brand Research survey of almost 900,000 respondents, when asked which sector is the most attractive to work in, information and communications technology (ICT) came out on top. In 2020 the results were the same as far as ICT ranking at the top, but the most attractive part of the profession changed from use of the latest technology to financial health in 2022.

A Model of Cooperation

Even with this positive perception, Hayes feels a sense of urgency in making sure the industry is doing enough to both attract and retain talent. "There are things that can be done, should be done, but need to be done with some urgency. We are at ground zero."

Given the current process of workforce development, which is funneled through 50 different state agencies, Hayes says there are examples of some strong efforts being made. He notes that Kentucky has created a workable solution by bringing together a variety of stakeholders. In 2016, the FOA was involved in supporting a program called "Kentucky Wired" as the state had the lowest broadband availability in the US. The state authorized $360 million to build a backbone network to connect the 95 counties in the state. Local and public/private partnership would buildout the connectivity.

"We flew into Lexington and brought together 60 people, including people from the Governor's office, contractors and representatives of colleges, and sat down for the day to figure out a plan. There are now

Kelly Mitchell, who was appointed to positions at the U.S. Departments of Commerce and Energy, will take the role of Executive Director for the Great Lakes Technical School for Utilities which will be launched in Q4 2023. It will be the "first all-encompassing technical school focused on underground utilities and telecommunications construction in partnership with major facilities owners". The group's goal is to create a diverse pipeline of qualified professionals.

nine colleges offering fiber optic programs that have thrived and supplied the technicians who build that state's Internet backbone. And many of these students used to be coal miners. It's an example of what you can do when you bring everyone together," says Hayes.

Funding for Training Programs

Bringing partners to the table to find solutions has been deemed so essential that it's a requirement to receive a grant from the Department of Labor called Strengthening Community College Training Grants. The grant helps community colleges provide the skills needed by employers in high demand industries.

"To access these grants, a community college needs three industry partners," explains **Megan Beresford**, Director of Broadband Programs, at Learn Design Apply. "The partnership needs to have a community college leading, but it can include public and provide non-profit four-year institutions, a workforce development system, and an employer partner. This partnership ensures that the community colleges understand exactly what skills students need to learn for jobs that are available. There is a huge demand for ICT skills."

Beresford points out this level of cooperation creates a talent ecosystem for companies that are involved in securing these types of grants. "The more your company is involved with workforce training and working directly with community colleges, bringing in much needed funds for cutting-edge training and reskilling, the better your company looks to future employees. I'm working with some companies who are already in discussions with local community colleges to set up a training program for field technicians."

There are other funding opportunities Learn Design Apply has identified in this sector, including:

- **Appalachian Regional Commission POWER Grant**—This initiative makes federal resources available to help communities and regions affected by job losses in coal mining, coal power plant operations, and coal-related supply chain or logistics industries due to the changing economics of America's energy production and the coal economy.
- **USDA ReConnect Grant Program**—Provides funding to assist in the development of essential community facilities in rural communities that have extreme unemployment and severe economic depression.
- **National Tribal Broadband Grant**—Provides funding for Tribes to hire consultants to perform feasibility studies for high-speed Internet deployment or expansion in Tribal communities.

Widening the Talent Pool

Using grants for workplace training is one tactic, and starting up organizations, companies, and schools to find a variety of talent needed for both current and future jobs is another. In Grand Rapids, a community effort is doing just that. John Hendershot created the Black Lake Companies in July 2022, after working with many minority companies in his construction career. When the pandemic hit, the minority community was especially affected, and Hendershot wanted to create a coalition of companies that could prevent future hardships. The first company that has emerged from this network is the Black Lake Utility Contractors. "This industry has been a challenge for African-Americans due to barriers with regard to access to capital," explains **Ange Kramo**, President and CFO of the company. Kramo's full-time job is as a senior financial analyst at DTE Energy for the Gas Pipeline Division. "Combining my business experience with John's network of companies, we see this

as a lucrative space. We will open our doors in January of 2023 and aim to become a model for other minority companies."

Attracting talent from minority communities to this industry requires a long-term strategy says Kramo. "Children need to be exposed to skilled trades from a young age. They need to explore these fields and understand what they are about. Ideally, they could find summer jobs working in these trades, while attending school. This would give them a broader vision of the many types of careers that are out there for them."

Once interest in the field is created, specific training must follow. That's where Kelly Mitchell fits in. She is opening the Great Lakes Technical School for Utilities and Telecommunications. Mitchell, who was appointed to positions at the U.S. Departments of Commerce and Energy, will take the role of Executive Director for the school which will be launched in Q4 2023. It will be the "first all-encompassing technical school focused on underground utilities and telecommunications

construction in partnership with major facilities owners". The group's goal is to create a diverse pipeline of qualified professionals.

All of these efforts in terms of community-building and expanding educational opportunities is a direct result of a shift in the industry's perspective. What was always done before needs to be reviewed, updated, and communicated to a workforce that has changed its needs over the past few years and will continue to view work from its own generational perspective. But the good news is that strides are being made and the industry seems committed to doing what is necessary. "It's a whole paradigm shift that the industry is undergoing and because of that we'll find the solutions we need," says Seidemann. ∎

ABOUT THE AUTHOR
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