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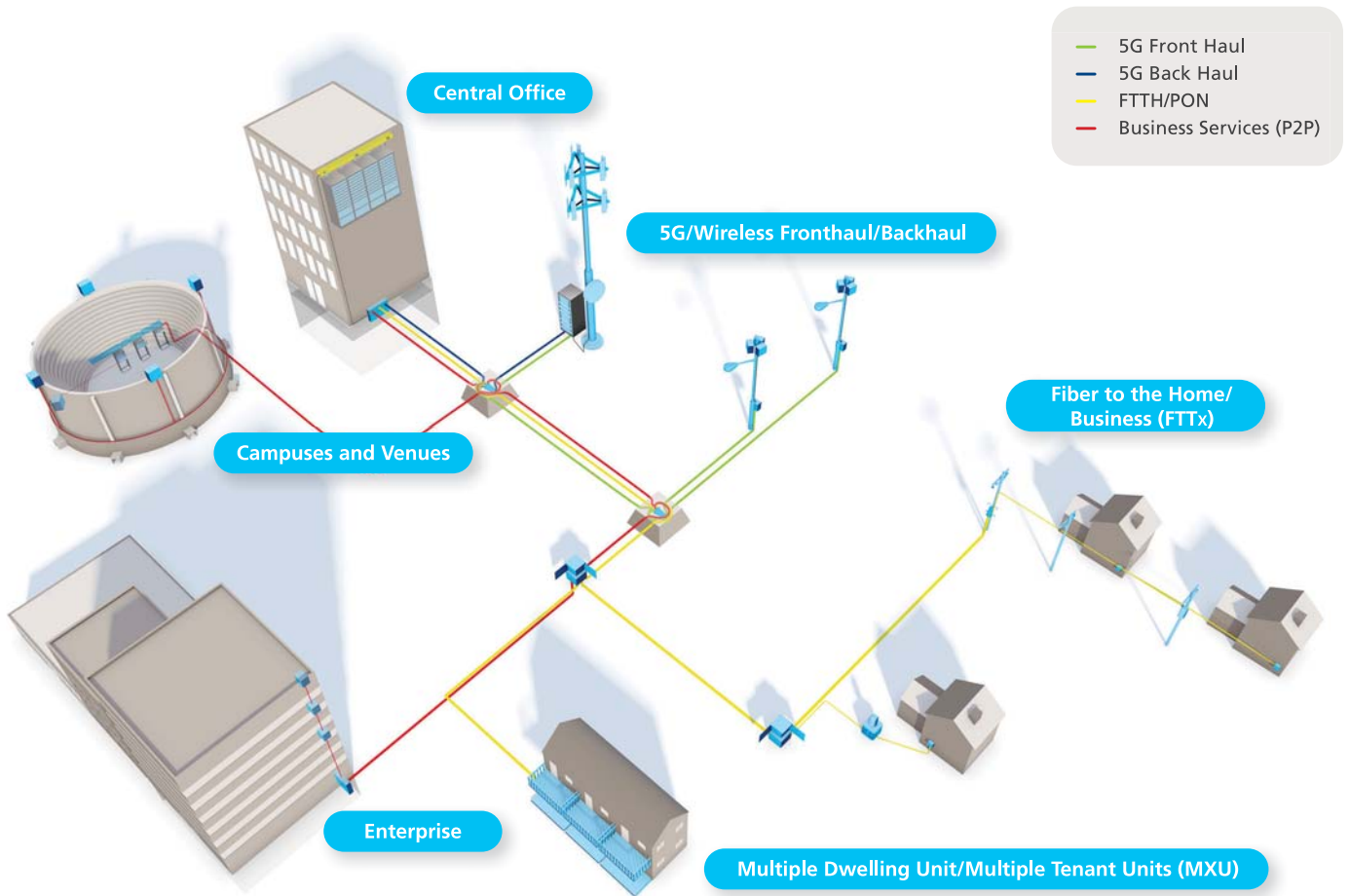
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Developing a Fiber Workforce Really Does Take a Village

Manufacturers' Hands-On Training Is a Key Element

THE FIBER OPTIC ASSOCIATION (FOA) was founded by a very diverse group of committed professionals who were committed to developing a workforce of qualified technicians that could help build the fiber optic networks. The group consisting of two university professors who taught fiber optic courses, two representatives of government agencies including the head of the standards agency for fiber optics, a couple of professional trainers, and trainers working for manufacturers of fiber optic components and equipment.

These manufacturers were all actively training customers and potential

customers in the field and all wanted to develop an industry-recognized certification for fiber optic technicians. One of the first things we noticed was companies were interested in buying fiber optic test sets, needed cable, connectors, other fiber optic components, and communications equipment. They were also lacking an understanding of fiber optics and wanted training on cables, splicing, termination, and other installation processes.

Together we developed a basic training program that could be shared across the United States. We also understood that we were stronger together.

So, we created cooperative fiber optic training seminars that began with a lecture program and ended with each manufacturer holding hands-on training sessions for their product specialty. (See Figure 1.)

Manufacturer training in fiber optics was a major factor in creating the fiber optic workforce that built the telecom, Internet, and hybrid fiber-coax CATV networks.

Unfortunately, manufacturer training was a victim of budget cutting over time. A more cost-effective



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solution came into view with the advent of streaming video and online learning. Today, many manufacturers have replaced their live training sessions with online video demonstrations of their products or online training courses.

Thankfully, some forward-thinking companies don't rely solely on online training. One of the companies today that shares the FOA founders' philosophy about training is Clearfield. We recently discussed Clearfield's view of customer training with Kelly Weissmann, Senior Manager of Technical Training and Support. Kelly came to Clearfield from Cincinnati Bell where she was a trainer, and she was originally trained in fiber optics by FOA Master Instructor, Tom Collins.

Our first question for Kelly was "Why does Clearfield still train the old-fashioned in-person way?" "We want our customers to have a positive experience with our products and that requires they know the proper use of the products. Remember 99% of the fiber techs are 'hands-on' people who prefer in-person training."

Kelly noted that Clearfield creates many product videos like most other companies today, but they consider



FIGURE 1. Dan Silver of 3M (right, at the Fiber U Conference in 1994), was one of the best trainers ever. He always enjoyed teaching others about 3M products. Dan was an advocate for training and certification and one of the founders of the FOA.

that backup for in-person training, not a substitute. Clearfield has eight people who do their training, and, besides the in-person training, they will accompany a customer's techs into the field to provide first-time installation support. (See Figure 2.)

Kelly told us that the most common comment they hear from fiber techs is that they do not get enough hands-on training. But besides that complaint, feedback from those techs is also a good source of product ideas—an incentive for innovation.

Clearfield is an FOA approved school and certifies their students through the FOA CFOT program. The structure of their program begins with FOA's on-line learning site, Fiber U (fiberu.org), as a prerequisite for class. The students get the classroom knowledge online first. Then, when they attend the typical 3-day class, almost all the time is

spent on the hands-on training they want and need.

There is a lot of hand-wringing today about the lack of enough trained workers to build the fiber optic networks being funded by the BEAD program and other IJA infrastructure projects. An excellent source of this training is often overlooked. Structured properly

and founded in objective educational learning, manufacturer's training could be one of the better solutions for workforce development and an effective promotion for the company itself. ■

Jim Hayes is a VDV writer, trainer, and the President of The Fiber Optic Association.



FIGURE 2. Kelly Weissmann, from Clearfield, is not only at home in the classroom, but she also routinely travels to help customers in the field understand how to properly use the company's products—on the ground and in the air!

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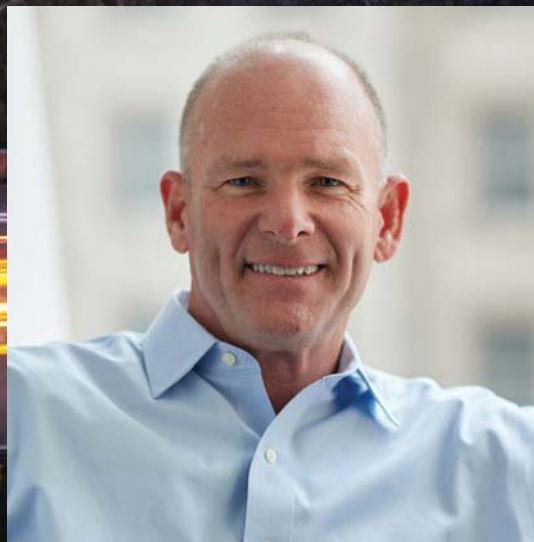
EXECUTIVE INSIGHTS WITH

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Meet Them
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“Fiberside Chat.”

BY SHARON VOLLMAN



Pictured left
to right: Chris
Creager, Advisor
and Board Member,
Tom Maguire, Chief
Operating Officer,
and Bob Mudge,
Chief Executive
Officer



brightspeed

What drives three retired Verizon executives to retire from their retirement? Learn what led them to transform a network from copper to fiber, create a “network build” culture and walk their talk that “people matter”.

TOPIC: Six Month Realities

ISE: April one—six months after launching as a standalone company—Brightspeed started selling its FTTP gig Internet service. Congratulations! What surprised you about the nuts and bolts of making this happen? Is there anything you would do differently now that you know what you know?

Tom Maguire: Believe it or not, I was surprised at how smoothly we launched—and I attribute this to the team’s preparation. I knew our team, especially the IT crew, put in countless hours with their counterparts with the previous owner to ensure that every loose end was secure, but I never imagined that things would have gone as smoothly as they did. Sure, we experienced a few bumps, but we quickly addressed and remedied them.

The fact that pretty much no one noticed that anything happened is the result of the Brightspeed and Lumen teams’ diligence and hard work.

Bob Mudge: Creating a “build ecosystem” in states that had minimal recent investment has been a big challenge. Beyond all the job functions that need to be expanded and the partners that must be engaged, there are intangible pieces that contribute to a network build culture. We needed to work extra hard to create a new culture. That said, launching our new product in just six months was a major accomplishment by our team.

Chris Creager: The core network needs more improvement than we anticipated. We knew the outside plant network had received little investment over the past few years, but the amount of investment to stabilize and improve the core network was surprising. Given the supply chain lead time for new equipment and cards, I wish we had spent more time assessing the core network at a deeper level. This has slowed our fiber roll out in some areas.

TOPIC: Risks

ISE: What’s the biggest professional risk you’ve taken during this launch?

Mudge: This stage of my career is very different and so is my role. I feel personally accountable to deliver on the Brightspeed promise we are making to customers who are often in underserved areas. I feel equally responsible to the Apollo team. I want to ensure their investment delivers the outcome they expect. Apollo was the catalyst for this endeavor, and they have provided bold leadership to make this happen.

Creager: The biggest risk was getting involved in so many different facets of creating the business. There were only a handful of employees and advisors, so we needed to jump in and create every aspect of this business, even if it wasn’t an area where we had prior experience. I remember being on calls discussing things like defining our general ledger accounts and risk management strategies before our CFO was hired. I’m definitely not an accountant, but I knew enough to engage the right people to figure it out. While it was a risk, it turned out well and it was a lot of fun.

Maguire: This is a little weird to ask a group of people that were basically retirees when we started this company, but I, for one, was very concerned about our reputations in the industry. Collectively we’ve spent over a century in the business building that reputation, and failure to deliver would definitely tarnish our reputations. I love what we’re building today and am excited for the legacy we are building for Brightspeed.

TOPIC: Leadership Style

ISE: Please share your leadership style and ONE word that encapsulates it.

Mudge: Driven.

Creager: I would say my style is authentic. As a broader leadership team, I would describe us as transparent, direct, and honest in our communications with each other and with our employees. Our leadership is who we are, and we do not behave differently as a leader or as a person.

Maguire: I was going to say annoying, but I think I’ll go with fair instead. I try not to take a *my-way-or-the-highway* approach to things because I realize that I am not the smartest or most experienced person in the room. I need to listen to what others have to say. Granted, I may stray at times, but that’s typically to immediately solve a problem or tackle a challenge. Otherwise, it is in the company’s (and my) best interest to be fair to everyone I encounter.

TOPIC: Core Beliefs Meet Real Life

ISE: The executive team developed a set of core beliefs (below) before your network went live. Now that you’re in the weeds, what’s the hardest one to deliver on as you progress? Why?

We believe people matter.

We believe in thinking like customers.

We believe in being real.

We believe in delivering on big ideas.

We believe in the speed of light.

We believe in celebrating success.

Maguire: I think the team is doing a good job of keeping egos in check and thinking like our customers (internal and external), but I’d like to see things go a little faster, especially the fiber build. We put a lot of thought into design and location of the build, but some of the things that have challenged the industry are still out there, such as permitting,



Chris, Tom and Bob (left to right) at Brightspeed's inaugural senior leadership meeting, Connect 2023.

pole attachments and locates—nothing new to the OSP world. Unfortunately, we are dependent on others' timelines, and it can be a slow-paced process. We want and need to move faster.

I look at places like Boston, where Bob directed the One Fiber build, and marvel at the way they simplified processes like permitting to accelerate construction. Unfortunately, we don't have uniform processes across all markets. I wish we could change this. Imagine when infrastructure subsidies hit, and providers are held up because a location will only issue a limited number of permits at a time—this is the reality we face.

Mudge: Moving at the speed of light is a challenge because so many external factors have an impact on our network build. When we work with municipalities that have a clear vision for bringing our fiber technology to their constituents, the process goes much faster. But again, looking back at only taking six months to launch our Brightspeed fiber product is a great indicator that we are working hard at an accelerated speed.

Creager: It's probably hardest to deliver on celebrating success. While I'm incredibly proud of what our employees have accomplished, and I love celebrating their accomplishments, I'm so focused on tackling the next big milestone that I need to make a concerted effort to stop and ensure the team looks back at what we've created and have accomplished in our first several months. We have a lot to be proud of.

TOPIC: Out of the Box Thinking

ISE: How has the Brightspeed team colored outside the lines to do business differently and better for its employees?

Mudge: We are creating a culture of minimal hierarchy and ensuring our frontline employees have a voice. They work with our customers on a daily basis and know what our customers are saying and what they want. They are customer service experts in the field. So, we listen to them, tap into them as a resource and empower them to ensure our customers are receiving the best service in the industry. From day one, we have been transparent and clear with Brightspeed employees. They know that our customers are a priority. This isn't just something we say, it's how we approach our business.

Creager: One of our core beliefs is people matter. When we launched the company, we announced a program called the

Shared Success Plan for all employees. It was a chance to solidify our commitment to this belief by creating an opportunity for every Brightspeed employee to share in the value we create together. No matter your role in this business, every employee has an opportunity to earn thousands of dollars when there is a future change in control of the company. Not many companies give employees this opportunity. It also aligns all of us around one set of common goals—creating value for our customers and the business.

Maguire: It is important to listen carefully to what the frontline has to say—managers, technicians, the whole team. These are the people who are physically with our customers every day, so their insights are important. I'm pretty sure this approach to the business wasn't what our employees were used to.

We also brought in a team of people, whether it's Colon McLean's team in HR or Amy Wulfestieg's team in Communications, who bring a fresh perspective to the things that most impact our employees—such as benefits, CBAs, and transparent communications.



TOPIC: Challenges

ISE: What's been the most challenging part of your job?

Mudge: We are making great progress improving our processes for better customer service. However, we acknowledge that we have a lot to do in this area. The opportunity to be the best network provider in the world is within our grasp, but the pace to get there will never be fast enough.

Creager: Building a network of this size and scope from scratch is a very complex and challenging task and can only be done with the integration of hundreds of vendors and suppliers. I believe in being real and authentic. It's frustrating



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when someone makes a commitment to provide certain services, but lacks follow through and accountability to deliver. I've always believed in under-promising and over-delivering. Unfortunately, not everyone employs this philosophy.

Maguire: I do not do well when dealing with things that are not in my direct control. I get very frustrated when customers are clamoring for broadband service, and I cannot deliver it because their local municipalities won't locate utility lines in a timely manner. For us to build a network, we need to know where we can build and are dependent on local municipalities. When we face this type of challenge, I'd just like the opportunity to bring in a team to locate and mark infrastructure on their behalf. This is one way of thinking outside of the box.

TOPIC: Inspiration

ISE: As an organization gets larger, there can be a tendency for the "institution" to dampen the "inspiration". How do you continue to inspire and engage?

Creager: We haven't seen that happen in our organization. Our vision is straightforward—build a fiber network to deliver a superb broadband service and customer experience to parts of the country that don't have access today. It's a compelling mission that employees are excited to take on. People get it. This is empowering to people and communities that otherwise would never have this opportunity. If anything, enthusiasm has grown as we expand.

Maguire: One way to ensure this doesn't happen is to manage from a customer perspective rather than top-down. Now, I'm definitely not saying we throw caution to the wind. After all, we have budgets, but if we keep an eye on what's really important—our big three of service improvement, building fiber, and enabling employees—I think we'll avoid a lot of institutionalizations.

Mudge: We continue to remain transparent and clear on our strategy by keeping it simple with three strategic priorities: stabilize service to rebuild our reputation, build a next-generation fiber network, and enable and invest in our employees. We want to make sure our employees feel vested in achieving our strategic priorities—our success is their success. This will help keep them inspired and engaged. Part of my role is to keep us nimble and very focused on these three simple priorities.

TOPIC: Team Member Kudos

ISE: Please share a team member who has moved the needle for Brightspeed's network and a specific example of what he/she/they have accomplished.

Mudge: I need to pivot on this question. There are dozens of remarkable people who have accomplished more than I could ever imagine, some of which I know Tom and Chris can highlight. Instead, I would add that our incredible support teams in finance, HR, legal, IT and others have also been incredible

creating an entirely new business while we also transform our network.

Creager: For me it's Brenda Rapp, who heads our procurement and supply chain organization. Everyone is aware of the supply chain challenges these days. Not only has she and her team been able to get in front of these issues to ensure we



have materials needed to build our network and run our day-to-day operations, but she had to hire the entire team, implement processes, and launch systems and infrastructure from scratch. We needed to establish relationships with hundreds of suppliers and vendors and incorporate them into our business to function seamlessly on Day One. This

segment of the business has performed very well from the moment we opened for business.

Maguire: This is a tough one because so many people worked hard to get us where we are and, more importantly, where we want to be. The one person that sticks out in my mind is Sherry Hessenthaler, VP and Head of Operations Strategy. She was one of the first three people I called (Jim McLaughlin and Lee Hicks were the others) when Bob, Chris and I decided to stay on with what would become Brightspeed, beyond the due diligence period. While I told each of them that they were the first call, it was probably Sherry.



Sherry did everything when we started out. Operations, finance, HR, TSAs, you name it, she did it. When she agreed to stay on and lead the fiber build, I knew we could not help but be successful. She is a giant in a field of giants, and I know my life would have been a lot tougher had she not been along for the ride.

TOPIC: Permitting and Easements

ISE: With BEAD funds being distributed soon, there's been much debate in DC about permitting and other approval processes that can result in significant deployment delays and increases in cost.¹ What would help solve these challenges?

Maguire: Streamlined permitting and approval processes would be a win all around. BEAD funds are great. Unfortunately, the funding only goes so far in bridging the digital divide. The process to get permitting for the infrastructure needed to bring high speed Internet to rural and underserved communities can be laborious and lengthy. As a new broadband company that is hyper-focused on rural and suburban communities, we are working to build the relationships

in the communities we serve and elevate our reputation as a responsible corporate citizen. We are committed to finding ways to easily navigate the permitting and approval processes. Right now, there is no one-size-fits-all solution to this issue as each community is unique.

TOPIC: Smooth Integration

ISE: While you're a new company, you also welcomed team members from Lumen, a legacy provider. How did you welcome them and grow as a fully integrated company?

Maguire: Since the Day One launch, we have been hyper-focused on our big three strategic priorities. Whether you are a new employee or a former Lumen employee now a Brightspeed employee, you know that Brightspeed has three main priorities: stabilize and improve the customer experience, build and sell our state-of-the-art fiber network, and enable our Brightspeed workforce. We all work together to ensure success in all three priorities. It's as simple as that.

Mudge: We were very intentional in creating our own culture at Brightspeed and fostering inclusion, transparency, and a customer-centered approach to doing business. No matter how you became a Brightspeed employee, once you are on team Brightspeed, you are expected to adopt that mindset and approach when tackling everyday tasks and

responding to our customers. We are a highly collaborative, mission-focused, and results-driven organization. When one succeeds, we all succeed. Success is ensuring our customers get what they pay for and live a connected life. We are also listening to the frontline workers—they know the communities, the customers, and the needs. By empowering them to share their voice and make real-time decisions in the field, we are meeting customer needs immediately.

TOPIC: ISE EXPO 2023 Opening Keynote: "A Fiberside Chat"

ISE: Share a few topics you'll address during the upcoming panel keynote discussion. Why should readers/attendees join you at ISE EXPO for the keynote?

Maguire: Because we're entertaining, of course.

Mudge: We came out of retirement to build a new company with a fresh approach to doing business in the telecom industry and we are going to tell you why. Spoiler alert: it's a great story. ■

REFERENCES AND NOTES

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A Blueprint for Risk Reduction

BY MARK FISHBURN

When you read “**Transforming**” your eyes may have raised to heaven thinking it was more irritating marketing hype. However, for me, “transformation” has a specific meaning. It’s the indication of a moment of discovery that inspires and immediately creates a new way of thinking—a new future. My intention is that this article creates such a moment for you. That it’s not just informative and certainly not just more hype. Yes, it’s informative too, but let’s start at the beginning.

Multiple connected clouds, edge compute, the explosion of IoT deployment, supply chains and distributed workforces have created the cybersecurity monster. It’s able to attack a myriad of vulnerabilities. The days of the data center’s single defendable perimeter are long gone. It’s been a couple

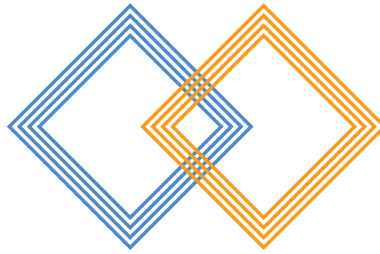
of years since John Kindervag’s Zero Trust mantras of “Assume Breach” and “Never Trust, Always Verify” became the imperative—the essential and now only viable way of ensuring that the network cloud ecosystem is secure.

By now you likely know that Zero Trust is never a complete solution but a strategy and a set of principles. Anyone who tries to tell you that they have a complete solution is either clueless or worse. At best it might be the beginnings of a service that implements and enables some of the Zero Trust principles. (See Figure 1.)

1. To enable Zero Trust principles, all users, software, and devices must be identified, authenticated, and their access limited according to the role assigned to them. Each actor must only be assigned the least privilege

required to accomplish a task. I.e., accessing a limited number of functions or data and only during the assigned periods.

2. They must manage and enforce and continually monitor to allow, block or quarantine access and generate notification of such events. This evolution is from the mantra to “Never Trust, *Continuously Verify*.” I.e., that interchanges remain verified ensuring trusted actors do not become threat actors or request out-of-policy actions.
3. The principles must be applied to all exchanges between workloads, between users and providers, at distributed access points, between IT systems and IoT devices. Its purpose is not just defense against inbound attacks but also preventing exfiltration of critical data.



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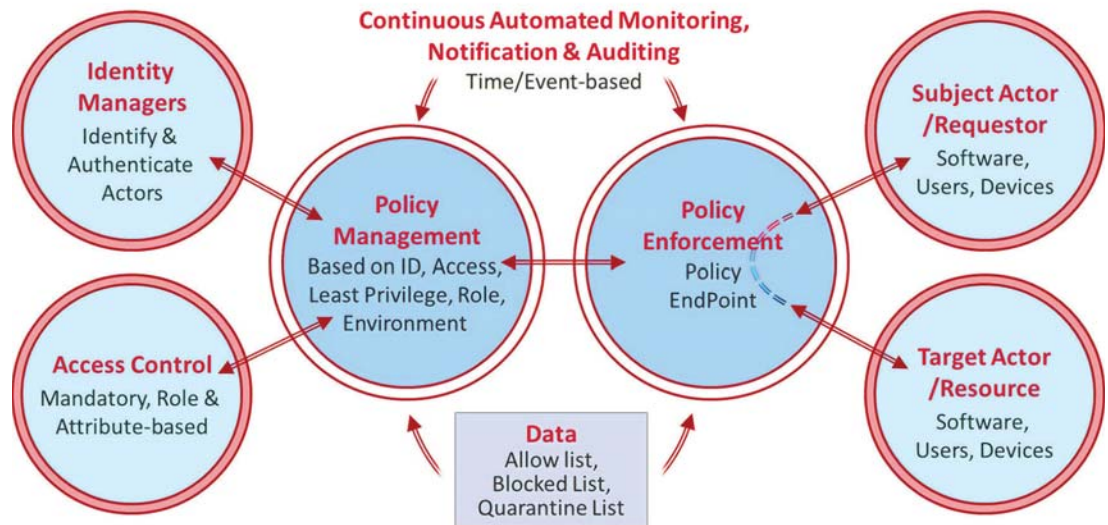


FIGURE 1. Implementing Services Enabled by Zero Trust Strategy and Principles

- Scaling via automation is essential and should be designed into products, via DevSecOps, accessed via secure APIs, ensuring all curated assets are up-to-date and avoiding human errors. The mindset should be to assume that a breach has already occurred.
- Distributed deployment is key since it must match the distributed nature of the Network Cloud Ecosystem and must reflect each enterprises requirements. In principle, it should be cautiously applied to limit processing requirements wherever a vulnerability is potentially damaging.

Zero Trust Transformative Thinking

Zero Trust’s “Never Trust, Always Verify” thinking, should not only be applied to your operational network, but **everywhere!** You may begin by wondering about the services and software, database systems, applications

and network devices. Why should I trust them now?

What about the companies that create the products? How do I know that I can trust them? Are they using best practices suggested by this year’s White House Security Strategy?¹ How can I trust the code they are using? The answer is you can’t—but you do need to hold them accountable!

This is critically important, as we saw in May’s attack in Dallas², it applies especially to the security software and the supplying companies which the Royal Ransomware attack disabled.

A Blueprint for Risk Reduction

If this sounds hard it isn’t. In fact, here are 3 sets of best practices—effectively a *Blueprint for Risk Reduction* to bring order to the complexity of cybersecurity.

In order to protect user organizations, implementation of Zero Trust enabled services and products, they must be in compliance with the following

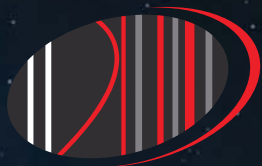
protective measures applicable to their organization, product development and operation. Such compliance should be made available transparently to subscribers of such products and services.

Taking Actions to Empower Your Organization

The good news is that this thinking enables empowering actions to be performed. The 23 questions in Figures 2, 3 and 4 are examples from my Cybersecurity as a Service offering. It’s the three categories that are important. The ones about an organization will be similar but will vary by product type.

- Software and service companies that **cannot give satisfactory answers to the majority of these questions** are essentially “disqualified”. The scary part is that they maybe haven’t thought about them! You should not contract with them and subscribe elsewhere. In any event, your contracts/legal department should have a say. I do believe that by asking these questions you will create an important partnership with your suppliers and help them establish their own best practices to align with the 2023 US Cybersecurity Strategy.¹ This is also exactly aligned to the June 2023 update from the White House⁴ on the Secure Software Development Framework initiative, where

“Remember, transformative thinking creates an instant shift for your entire organization, its practices and that of your vendors, providers, contractors, and supply chains to verify their operation, not to just trust them.”



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companies are being required to attest to their development practices.

- Conversely, **end user organizations who do not ask these questions** of their software suppliers, service providers, their security vendors **and of their own departments are likely abdicating responsibility and will remain vulnerable or worse.**

For me, this is the transformative moment that I referred to in the headline. To truly **delegate not abdicate, to take control to be responsible.** Now, you'll no longer be overwhelmed by this topic. As

we said, this shift in thinking is effectively a Blueprint for Risk Reduction that empowers your actions and your role!

A word on **Zero Day** attacks: These are attacks that have never been seen before and thus have yet to have a defense. Sometimes they get fixed by software vendors such as Microsoft, Apple and Google in regular monthly updates. Others linger for years unnoticed. They all start with the penetration of an organization then launch any number of attack types. However, if you act early and apply all the Zero Trust strategies

and principles, especially the first two in Figure 4, the risk of any attack—including Zero Days—is massively reduced.

Keep Up Your Awareness

There are new threats developing each day. Many are multifaceted, complex, and polymorphic. “Hacking as a Service” toolkit is one ugly example of why you need to keep alert. One of many credible resources is cybyr.com. There, I've introduced Security as a Service with software that walks you through the process and measures your progress holistically, over time. Become a passionate student, visit my “CyberPedia” page³ explaining 200 cybersecurity terms—many used here—and for the latest breaking news on threat detection and prevention.

Finally, **don't stress out.** Zero Trust is no overnight fix. It's a journey with the mantra “Never Trust Always and Continuously Verify”. It begins with curation of assets and services to see which, based on the financial impact, to protect first. Remember, each action you take strengthens your weakest links and reduces your risks. ■

1. Executive level Security Policy and Strategy.
2. Curated and automatically updated software, device drivers, data, and networking assets.
3. Insider threats and social engineering strategy.
4. Phishing attack prevention software with ongoing staff training.
5. An implemented policy for multi-factor authentication, passkeys, trustworthy password managers, etc.
6. Proactive intrusion, threat detection and prevention.
7. Use of “Bring Your Own Devices” is disallowed everywhere, including subcontractors.
8. Least privilege and protection against elevation of privilege attacks is implemented.
9. All third-party software is screened for vulnerabilities, e.g., CMS, CRM, and databases.

FIGURE 2. Holistic Organizational Security Best Practices

1. All development is performed according to the best practices in Figure 2.
2. DevSecOps includes automation of monitoring and event notification built in.
3. All software is encoded in Memory-Safe languages, e.g., Rust or C#.
4. All third-party code is verified malware free, especially any open-source code.
5. Software/updates are tested for protection to threats in Figure 4 and all hardware, software, drivers, and firmware updates are automated.

FIGURE 3. Development Best Practices

1. Database software/apps only permit bulk encryption, exfiltration of data via authenticated privilege.
2. All data or software defining the privilege levels of users' software and devices are protected/ encrypted to protect against elevation of privilege attacks. Privilege includes length or time, amounts of data to be accessed, written or read, including software updates, approved encryption types.
3. Access control and identity management software is similarly verified and protected.
4. All firmware or device updates are only from certified sources.
5. Management software detects and protects unauthorized out-of-policy access, disabling denial of service attacks with service suspension if encountered.
6. Detection, notification, and prevention of any attacks is via automated monitoring.
7. Multi-factor authentication is applied to critical software and databases not just users.
8. All APIs are certified to mTLS or SAML specifications.
9. Detection and prevention are implemented for lateral movement attacks, drive-by, man-in-the-middle, side channel, TCP split handshake attacks, etc.

FIGURE 4. Product and Service Operational Best Practices

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Mark Fishburn has 5 decades of experience in software, networking, and security. He is a member of both the MEF and ONUG working groups and publisher of the Holistic Cybersecurity book: *Hey Who Left The Back Door Open?* For more information, or to comment, please email mark@cybyr.com or visit cybyr.com. Follow him on LinkedIn: www.linkedin.com/in/markfishburn/.



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AI/ML/AR and Digital Transformation Take the Field

The Right Field Service Management Strategy Supports Your Game Plan

BY BRAD HAWKINS

The world has moved on from the global health crisis of 2020, but the digital transformation trend is here to stay. The pandemic accelerated digital transformation’s adoption as companies recognized its value in facilitating pivots to business operations. Digitalization allowed employees to work remotely, maintaining workflow—and, in some cases, boosted—productivity and mitigated disruptions. Today, digital transformation remains integral to many industries, including the telecommunication sector.

In fact, according to the EY Tech Horizon Study,¹ today’s inflationary pressures make it more vital than ever that telcos increase efficiency and agility. However, almost 40% of telcos cite the high cost of technology infrastructure as a barrier to executing digital transformation goals. Impending regulatory changes and technological advances create an influx of work, and telcos must invest in digital tools—like field service management software—designed to set them up for success. This investment can contribute to:

- Improving customer retention, acquisition, and satisfaction.
- Elevating workplace cultures.
- Reaching—and exceeding—revenue goals.

One aspect of telecom, in particular, has the potential to capitalize on the power of digital transformation. Short-cycle telco jobs—router installations, phone set up, equipment updates, cell tower maintenance and repair—can reap significant benefits.

In a world where data drives every decision, interface, and process, digital transformation will drive data-centricity. Here’s how it will help telecom companies in particular.

Seven High-Impact Benefits

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digital transformation *can* help streamline the process and help the humans tasked with these jobs. But those aren't digital transformation's only contributions to the telco industry. Consider these seven areas where digital transformation helps move the needle to make telcos operations more effective and efficient.

1. AUTOMATING OPERATIONS

Telcos are using AI-powered field service software to automate manual, error-prone jobs—like billing and maintenance scheduling—which frees employees to focus on more complex, higher-value tasks like troubleshooting problems and providing customer support. Other benefits telcos see from automating operations include:

- Improved efficiency and faster response times.
- Lower operating costs.
- Reduced human error.
- More satisfied customers.

Field service management software can transform short-cycle telecommunication jobs like router installation and maintenance.



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2. ADVANCED ANALYTICS

Leveraging advanced analytics to build predictive capability models helps telco gather data to inform decisions about network planning and optimize network performance. These analytics can help detect and flag anomalies for faster mitigation. This data enables managers to shrink customer acquisition costs and reduce employee *and* customer churn.

Additionally, Broadband Service Providers (BSPs) can leverage data analytics captured from their field service management software to increase operational visibility and enhance decision making by crafting custom dashboards based on their KPIs. With the ability to monitor short-cycle jobs with a bird's-eye view, managers can make strategic decisions for their telco teams.

3. AGILE DEVELOPMENT

Traditionally, agile models save time and money because they support a flexible approach with continuous testing and responsiveness, making it easier to pivot and adjust. Within

the telco industry, identifying a field service solution that has an agile approach enables companies to:

- Improve their innovation.
- Respond more quickly to evolving market demands.
- Deliver new products and services faster.
- Address unexpected customer challenges.
- Provide field workers with key information to resolve problems rapidly.

4. CLOUD COMPUTING

Streaming technologies made possible by digital transformation have expanded far beyond their humble beginnings to deliver a greater impact affecting the scalability of operations, reducing capital expenditures, improving resource utilization, and accelerating the rapid deployment of new services. By leveraging a field service solution that is backed by a powerful data cloud, telcos can depend on digital access to important documents, forms, and customer data when on short-cycle jobs.

The telecom cloud market is estimated to surpass over \$105 million by 2030,² with a CAGR of over 14% between 2022 and 2030. Within the telco industry, cloud computing enables companies and their teams to be more flexible in meeting customer needs. Service operators can create cloud data warehouses to store customer data, migrate and process data remotely, and more, for short-cycle jobs.

Whether they opt to use a cloud delivery, network service or communication cloud service model, telco companies will see critical benefits including:

- Reduced costs.
- Enhanced telecom data centers.
- More secure business data.
- Increased flexibility for resource allocation.
- More user-friendly technology.
- More effective customer data harnessing.

5. DIGITAL CUSTOMER EXPERIENCE

The best thing about digital customer experiences? They offer a seamless, personalized experience—plus an “anywhere, anytime” approach and a myriad of channels for customers to connect with telcos and their short-cycle teams: field service platforms, social media, mobile apps, or the web. A potent example of this is how technicians can leverage a field service platform to impact customer satisfaction and reduce churn.

As digital experiences continue to evolve, customers expect short-cycle telco teams to anticipate their needs and provide solutions for service and support. Digital customer experience facilitates communications between customers and employees, drives customer engagement, improves accessibility while offering omnichannel support, and self-service options.

6. PREDICTIVE MAINTENANCE

We'd all love a Magic 8 Ball in our toolbox, but predictive maintenance powered by digital transformation is the next

best thing. Thanks to AI, predictive analytics can identify and address network issues, alerting teams to minor problems before they escalate into larger ones. Predictive maintenance improves network uptime with fewer disruptions, reduces repair costs and increases customer satisfaction. AI can analyze real-time and historical data collected from IoT-connected equipment to monitor equipment prone to failure and exchange it before it breaks down—potentially eliminating the need for future maintenance down the road.

7. CYBERSECURITY

While digital transformation has, unfortunately, given rise to new cybersecurity threats, it offers solutions to protect sensitive data from hacking. Advanced cybersecurity measures include configurations incorporating endpoint risk analytics, anti-malware, and machine learning (ML) threat prevention to safeguard telco companies and customer networks, data, and infrastructure. Choosing a field service software with advanced cybersecurity measures generates greater customer trust and reduces the company's risk of reputational damage.

Special Teams Impact Customer QoE

To acquire and retain customers in very competitive environments—and maximize operational efficiency and profitability, telco companies must deliver exceptional customer experiences. Companies that stand out above the competition prioritize improving the management of short-cycle jobs via digital transformation with field service management platforms that include:

- Analytics
- Customer self-service
- Mobile access
- AI-powered scheduling
- Route optimization

Augmented reality (AR) allows field service management tools to support sustainability efforts as well, with the power of schedule and route optimization allowing technicians to structure their day and routes efficiently—reducing gas and personnel expenses while reducing CO2 emissions—and maximize resources in general.

Here are other ways digital transformation continues to support short-cycle telco jobs:

- **Training and Development:** Telco companies can use digital platforms to provide short-cycle employees with on-demand training and development opportunities. E-learning platforms offer access to online courses, webinars, and other educational resources that help employees build new skills and stay up to date with the latest industry trends.
- **Collaboration and Communication:** Instant messaging, project management software, and video conferencing via a field service software-powered portal helps short-cycle employees stay connected with their customers and colleagues—and work together more effectively. These tools

are particularly critical for remote or contracted workers lacking regular face-to-face access and interaction with their colleagues. And the tools allow customers to chat digitally with technicians, who can assess issues and bring the right tools and equipment to the site, saving time.

- **Inventory Management:** Field service management software helps keep track of the parts and tools technicians have (or don't have) in their trucks, communicating that information to dispatch—an approach that saves time by not assigning techs to jobs they lack the tools to complete in one visit. And field service management also improves customer experience and increases productivity, saving companies time and money.
- **Digital Upskilling:** As digital transformation forces evolutions in the technology it runs, short-cycle employees will need to develop new skills. Offering upskilling opportunities enables employees to learn new programming languages, data analysis tools, and other high-demand skills that will help them stay competitive in the job market—and keep them with your company.
- **Performance Management:** Provide short-cycle employees with real-time feedback on their performance, allowing them to make adjustments and improve their skills more quickly. Regular feedback keeps employees engaged and motivated and can help telco companies identify high-performing employees and provide them with opportunities for career advancement, while bolstering telco operations. Some field service software platforms, for example, allow managers to track each short-cycle technician's areas of expertise. When a more complex job request arises, AI can identify which employee has the suitable skill set and automatically assign a technician with the ability to complete the job well.

Thriving in this tumultuous market means adapting to changing landscapes, staying relevant, and generating revenue. BSPs should embrace and implement digital transformation field service management solutions to support short-cycle employees.

And since many short-cycle jobs are potentially the first (and often only) major touchpoint customers have with a telco company, it pays to have a strong, positive impression. By investing in their employees' development and well-being, telco companies can build a stable and motivated workforce capable of driving innovation and growth in the industry. ■

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Brad Hawkins is Chief Product Officer, ServicePower. For more information, email info@servicepower.com or visit www.servicepower.com. Follow ServicePower on Twitter @ServicePowerPlc, Facebook: www.facebook.com/ServicePowerPlc/, and LinkedIn: www.linkedin.com/company/servicepower/.

ICT Visionary Q&A

Kevin Morgan, Chief Marketing Officer, Clearfield



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+ TOPIC BEAD Mapping

The newest BEAD map released in late May shows that more than 8.3 million US homes and businesses lack access to high-speed broadband (nearly 330,000 unserved locations more than the first version, or a 0.2% increase). Share your take on mapping and BEAD funding.

Kevin: The BEAD and the FCC mapping process are to be applauded. Earlier attempts by the federal government to bridge the digital divide set lofty targets and contained funding mechanisms that only “kicked the can down the road”. This time around, the government did something right. With bipartisan support, congress authorized the right agency (NTIA) to administer the funds and tasked the right body (FCC) with developing maps. Despite disputes between states and the FCC, the mapping process prevailed and the \$42.45B BEAD allocations were announced on schedule. The transparency of the process gives me hope that all Americans will now be able to participate with Clearfield in fiber deployments that enable the lifestyle better broadband provides.

+ TOPIC Permitting

Industry leaders have urged Congress to quickly streamline broadband permitting processes. They argue that inconsistent processes, delays, pole attachment, and environmental regulations could slow fiber deployments being funded by BEAD. What is a tactic to help ease these permitting problems?

Kevin: Permitting is a fact of life when it comes to broadband fiber deployment. Two things can be done to alleviate the burden of permitting. First, choose the right product and second, streamline the process. Recent product advancements in fiber optic deployment developed ways to reduce the constraints of permitting. For example, Clearfield now has fiber distribution hub (FDH) cabinets with aerial strand mount options essentially removing the right-of-way paperwork of traditional vaults or pole-mount attachment fees. Second, some states like South Carolina have taken the guess work out of permitting by requiring any entity who receives funding to attend an orientation session specifically on broadband permitting and have developed their own special broadband permit application designed to remove unnecessary permitting roadblocks.

+ TOPIC Converting Homes Passed to Homes Connected

Telecom providers still have trouble converting “homes passed” to “homes connected”. Only 20 countries across the globe currently have more than a 50% fiber penetration rate. What’s a feasible solution?

Kevin: At Clearfield, we always strive to make the deployment easier to install in less time and with less-skilled labor. Our FastPass™ Connect methodology cuts the time to connect the home by 35% using our deploy reel and factory-tested, pre-terminated fiber drop cables. A customer commissioned time study proved this FastPass Connect method saved them 30 minutes for every home connected. Equally important, that service provider was able to cut repeat resolutions—truck rolls to fix what wasn’t done right the first time—by 43%. ■

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MONDAY, AUGUST 28

- 8:00 AM – 5:00 PM Exhibitor Move-in
- 11:30 AM – 7:00 PM Hands-on Fiber Training
(additional fee required)

TUESDAY, AUGUST 29

- 7:30 AM – 2:00 PM Golf Outing
- 8:00 AM – 5:00 PM Exhibitor Move-in
- 9:00 AM – 5:45 PM Hands-on Fiber Training
- 12:00 PM – 5:00 PM Registration Open
- 1:00 PM – 4:00 PM Light Brigade Workshop
(additional fee required)

WEDNESDAY, AUGUST 30

- 7:00 AM – 5:00 PM Registration Open
- 7:00 AM – 10:00 AM Exhibitor Move-in
- 8:00 AM – 10:15 AM Seminar Sessions
- 9:15 AM – 10:15 AM Women in Telecom (WIT) Panel Discussion
- 10:30 AM – 11:30 AM Opening Keynote | Brightspeed Keynote Panel
- 11:30 AM – 5:00 PM Exhibit Hall Open
- 12:00 PM – 1:30 PM Lunch on Exhibit Floor
- 1:00 PM – 3:30 PM Demo Zone Open (on Exhibit Floor)
- 1:00 PM – 4:00 PM Seminar Sessions
- 3:30 PM – 5:00 PM Networking Happy Hour (on Exhibit Floor)

THURSDAY, AUGUST 31

- 7:00 AM – 2:30 PM Registration Open
- 8:00 AM – 10:15 AM Seminar Sessions
- 8:30 AM – 10:00 AM Executive Roundtable (Closed Door)
- 10:30 AM – 11:30 AM Closing Keynote | Tech Talk Presentations
- 11:30 AM – 3:00 PM Exhibit Hall Open
- 12:00 PM – 1:30 PM Lunch on Exhibit Floor
- 1:00 PM – 2:30 PM Demo Zone Open (on Exhibit Floor)
- 2:45 PM – 3:00 PM Attendee Giveaway (in Demo Zone)
- 3:00 PM – 7:00 PM Exhibitor Move-out

FRIDAY, SEPTEMBER 1

- 8:00 AM – 12:00 PM Exhibitor Move-out

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5G Mobile Infrastructure Evolution

TRACK 2:

FTTx/Optical Networks

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TRACK 2 FTTx/Optical Networks

TRACK 3 Power/Sustainability

MONDAY, AUGUST 28, 2023

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TUESDAY, AUGUST 29, 2023

7:30 AM – 2:00 PM 2nd Annual Golf Outing | DRUMM FARM GOLF COURSE

9:00 AM – 5:45 PM Hands-on Fiber Training (Day 2) Powered by SCTE in Partnership with ISE EXPO • BARTLE ROOM 2104B

1:00 PM – 4:00 PM

Training Session: Help Close the Digital Divide—FTTx Outside Plant Design
• BARTLE ROOM 2201
Danny Huffman—*ONUG Communications*
Sean Kelly—*Light Brigade*

WEDNESDAY, AUGUST 30, 2023

8:00 AM – 9:00 AM

Panel Discussion: Rethinking Rural
• BARTLE ROOM 2202
Allen Hemrich—*Mears Group*
Barry Walton—*Corning Optical Communications*
Calvin Deleavey—*Mobia Technology Innovations*
Chad Dillon—*Twin Lakes*
Stephen Milner—*Planters Telephone Cooperative*

CommScope Maximizes FTTH ROI with Data Driven Network Selections
• BARTLE ROOM 2205
Motaz Abulibeh—*CommScope*

PON Holds the Key to Efficient Next-Gen Network Deployments
• BARTLE ROOM 2201
Craig Hemperly—*Wesco*

Enhancing the Telecom Power Grid
• BARTLE ROOM 2204
Tony Wilson—*Superior Essex*

9:15 AM – 10:15 AM

Panel Discussion: Women in Telecom (WIT) • BARTLE ROOM 2102A

Janice Oliva—*Endeavor Business Media* • Katy Greenfield—*Telstra* • Sherry Hessenthaler—*Brightspeed* • Karin Strub—*Infrastructure Resources* • Emily McGinn—*Windstream Enterprise* • Beth Hannan—*Meta* • Kim Hartwell—*Corning Optical Communications*

Running Compliant Projects with Your Federal Funds
• BARTLE ROOM 2201
Joshua Broder—*Tilson*

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Solving the Resource Challenge by Scaling
the Upskill Solution • **BARTLE ROOM 2203**
Bob Morphew—*Tersus Services*

Solving Permitting Challenges with GIS
Solutions • **BARTLE ROOM 2204**
Dustin Heath—*CHR Solutions*
Randall Rene—*Esri*

Closing the Digital Divide with the Utility
Business Model • **BARTLE ROOM 2203**
Joshua Leonard—*Burns & McDonnell*

Edge Computing Is a Big Deal—Are You
Ready to Cool It? • **BARTLE ROOM 2205**
Jim Magallanes—*TechniCool Innovations, Inc.*

Opportunities for Applying Digital
Technologies to Fiber Network
Construction Projects • **BARTLE ROOM 2206**
Patrick McLaughlin—*Endeavor Business Media*

Case Study: Proactive End-to-End
Customer Experience Through AI and
Automation • **BARTLE ROOM 2202**
Melissa Basciano—*Verizon*
Dennis Klein—*Verizon*
John DiLiegro—*Verizon*
Michael Strollo—*Verizon*

TRACK 1 5G Mobile Infrastructure Evolution

TRACK 2 FTTx/Optical Networks

TRACK 3 Power/Sustainability

WEDNESDAY, AUGUST 30, 2023

10:30 AM – 11:30 AM	Opening Keynote Brightspeed Keynote Panel – A Fiberside Chat • BARTLE ROOM 2103 ABC Learn from Brightspeed’s executive leadership team during “A Fiberside Chat”. Discover the secrets behind their “boots on the ground” approach to deploying an FTTP network across 17 states by the end of 2023. They’ll discuss solutions to rapid delivery of XGS-PON and Wi-Fi 6 to underserved areas across the Midwest and Southeast as well as how potential BEAD funding can expand the company’s build plans. They’ll dive into topics that include finding the right talent, fostering vendor relationships to meet build demands, and more. Chris Creager– <i>Brightspeed</i> • Tom Maguire– <i>Brightspeed</i> • Bob Mudge– <i>Brightspeed</i>		
11:30 AM – 5:00 PM	Exhibit Hall Open		
12:00 PM – 1:30 PM	Lunch on Exhibit Floor		
1:00 PM – 3:30 PM	Demo Zone Open (on Exhibit Floor)		
1:00 PM – 2:00 PM	Transitioning to a True 5G Connected World • BARTLE ROOM 2204 Prasad Kodaypak– <i>Radisys</i>		
	Setting Up for Success with Wi-Fi 6E • BARTLE ROOM 2205 Andrew Cuellar– <i>Zyxel Communications</i>		
2:00 PM – 3:00 PM	Speed, Accessibility and Productivity: How to Prepare Your Legacy Fiber Management Data for Digital Transformation • BARTLE ROOM 2202 Will Jonas– <i>VETRO</i> James Irvine– <i>VETRO</i>	Fiber Troubleshooting–Efficient Methods for Fault Identification and Repair • BARTLE ROOM 2201 Sean Kelly– <i>Light Brigade</i>	
3:00 PM – 4:00 PM	Optimizing 10G-PON and Beyond User Experience in the Home • BARTLE ROOM 2202 John George– <i>OFS</i>	Case Study: Battling the Forces of Evil to Deliver FTTx to the Underserved – Critical Success Factors Panel • BARTLE ROOM 2201 Nilesh Shroff– <i>Brightspeed</i> Jay Cadman– <i>IQGeo</i>	
3:30 PM – 5:00 PM	Networking Happy Hour (on Exhibit Floor)		

TRACK 4
Construction & Engineering/
BEAD & Middle Mile Network

TRACK 5
Network Reliability &
Maintenance/Testing/Security/
Damage Prevention/Safety

TRACK 6
Talent & Leadership Training/
DEI/Professional Development/
Upskilling/Workforce Solutions

<p>Utilizing IMU Mapping Technologies to Streamline and Improve Your As-Built Process • BARTLE ROOM 2206 Eric Cope–<i>Intelligent Mapping LLC</i></p>	<p>The Human Factor of Connectivity: Accelerating Tech’s Learning Curve AND Fiber Deployment Efficiencies • BARTLE ROOM 2202 Guillaume Lavallee – <i>EXFO</i></p> <p>Lightning Mitigation • BARTLE ROOM 2201 Jerry Hogan–<i>Solara Technical</i></p>	<p>Esports: A Competitive Edge for Telecom Talent Recruitment in Rural Spaces • BARTLE ROOM 2203 Joshua Seidemann–<i>NTCA-The Rural Broadband Association</i></p>
<p>Getting on Board with BEAD Applications • BARTLE ROOM 2205 Megan Beresford–<i>Learn Design Apply Inc.</i></p>	<p>Energy Storage Solutions for Increased Network Reliability • BARTLE ROOM 2204 Mike Johnson–<i>Charles Industries LLC, an Amphenol company</i> Steve Latham–<i>Charles Industries LLC, an Amphenol company</i></p>	<p>Rapid Fiber Deployment and Workforce Engagement • BARTLE ROOM 2203 Kelly Weissmann–<i>Clearfield</i></p>
<p>Panel Discussion: Hidden Costs of Construction • BARTLE ROOM 2206 Bob Whitman–<i>Corning Optical Communications</i> David Eckard–<i>Nokia</i></p>		
<p>Automating Network Planning Supports BEAD and Cost Containment • BARTLE ROOM 2204 Kyle Berg–<i>Arrow by Altman Solon</i></p>		
<p>FTTx Lessons Learned from Construction to Maintenance to Customer Satisfaction • BARTLE ROOM 2205 Prateek Chakravarty–<i>Zinier</i></p>		
<p>Intelligent Build–Harnessing the Power of Digitization in Construction • BARTLE ROOM 2206 Seán Adam–<i>AFL</i></p>		

	TRACK 1 5G Mobile Infrastructure Evolution	TRACK 2 FTTx/Optical Networks	TRACK 3 Power/Sustainability
THURSDAY, AUGUST 31, 2023			
8:00 AM – 9:00 AM		Solving the Troubles with Troubleshooting FTTH Networks • BARTLE ROOM 2201 Steven Harris– <i>SCTE</i>	
8:30 AM – 10:00 AM	Executive Roundtable (Closed Door) • BARTLE ROOM 2102A Participating companies are Clearfield, Congruex, Esri, and Future Infrastructure.		
9:15 AM – 10:15 AM	Case Study: Wireline & 5G Fixed Wireless Access Deployment Strategy • BARTLE ROOM 2204 Robert Sheehan– <i>Verizon</i> Marc Durocher– <i>Verizon</i>	Leveraging Hybrid (Fiber/Copper) Connectivity for Real-World Networks • BARTLE ROOM 2201 Jim Pelegris– <i>SENKO Advanced Components</i>	
10:30 AM – 11:30 AM	Closing Keynote Tech Talk Presentations • BARTLE ROOM 2103 ABC These leaders walk in your shoes and have the scars to show it. From field fiber frenzies to trouble tickets that could have been prevented—they get you! Join the leaders and doers who have distilled their years of experiences into 10 minutes of network evolution wisdom that will help your team perform better and your reputation rise. Our Tech Talk presenters deliver the bite-sized knowledge you crave, complete with the ability to shake hands after their keynote. <i>John Amundson–TDS Telecom</i> <i>Brian Bond–Brightspeed</i> <i>Charlie Cano–Etex Telephone Cooperative</i> <i>Ashley Travers–Verizon</i>		
11:30 AM – 3:00 PM	Exhibit Hall Open		
12:00 PM – 1:30 PM	Lunch on Exhibit Floor		
1:00 PM – 2:30 PM	Demo Zone Open (on Exhibit Floor)		
2:45 PM – 3:00 PM	Attendee Giveaway (in Demo Zone)		

For the most up to date schedule, please visit www.iseexpo.com.

TRACK 4
**Construction & Engineering/
 BEAD & Middle Mile Network**

TRACK 5
**Network Reliability &
 Maintenance/Testing/Security/
 Damage Prevention/Safety**

TRACK 6
**Talent & Leadership Training/
 DEI/Professional Development/
 Upskilling/Workforce Solutions**

Digitizing to Digging with GIS to Breakthrough Roadblocks in Fiber Permitting and Construction • **BARTLE ROOM 2205**
 Drew Peele – 3-GIS

Prevent Fiber Cuts that Lead to Bad PR and Reduced Profits • **BARTLE ROOM 2203**
 Scott Landes – *Infrastructure Resources*
 Shane Bryan – *Ritter Communications*

Developing Your Team’s Superpower of EQ • **BARTLE ROOM 2204**
 Dustin Dale – *Beyond the Horizon Consulting*

Solving the MDU Gigabit Coverage Challenge • **BARTLE ROOM 2206**
 Pierre Trudeau – *Positron Access Solutions Corp.*

Managing SLAs and Regulatory Compliance Using Infrastructure Management Platforms • **BARTLE ROOM 2202**
 Kianoosh Yazdani – *Dugo Systems Inc.*

Using Technology to Optimize OSP Route Selection and Improve the Pole Attachment Application Process • **BARTLE ROOM 2206**
 Ron Bilodeau – *Osmose Utilities Services Inc.*

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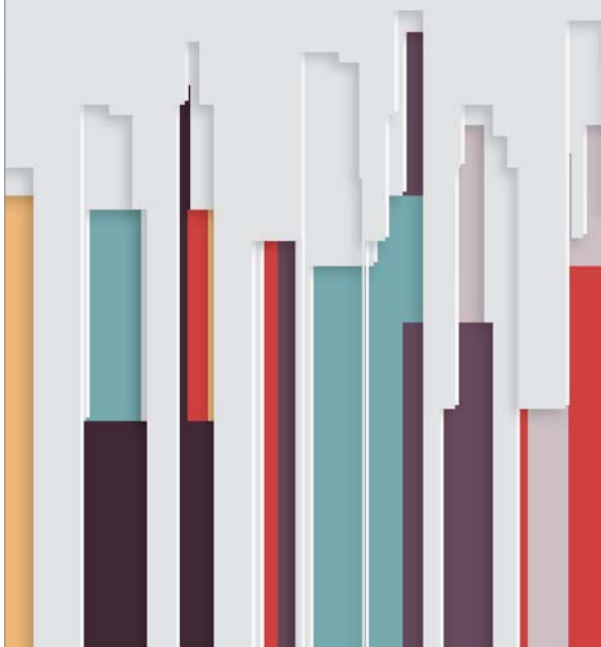


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www.cpeitalia.it

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Craftmark Cable Markers..... 1121

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Fort Worth, TX 76119
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Emtelle is a global manufacturer of pre-connectorized, blown fiber and ducted network solutions, whose research, development, and innovation have served the telecom and power industries for over 40 years. With excellent customer service and access to industry expertise, we empower customers to maximize their infrastructure rollouts in a supported, efficient, and sustainable way, fostering connections across the globe. Together, everything connects.



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Phone: 303-912-2335
www.fullcirclefiberpartners.com

Full Circle Fiber Partners is a market-leading company serving the demand for fiber and OSP technology engineering, design, deployment, and support for customers in multiple geographies throughout the United States. Formed in 2020, Full Circle Fiber is led by a team of seasoned cable and telecom veterans. Backed by our capital partner, Mill Point Capital, Full Circle Fiber invests in lower middle market companies providing the opportunity to grow and become more profitable.



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www.hubbell.com

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Incab America 1228

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www.intelligentmapping.com

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www.iqgeo.com

IQGeo's end-to-end geospatial software improves productivity and collaboration across enterprise sales, planning, design, construction, and maintenance processes for telecom and utility network operators. Our mobile-first enterprise solutions create and maintain an accurate view of complex network assets that are easily accessible by anyone, wherever and whenever needed.



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Knet..... 1111

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www.lamarchemfg.com

La Marche Manufacturing is a trusted provider of a wide range of crucial power products for the telecom market. Our comprehensive offerings include battery chargers, UPS systems, rectifiers, converters, inverters, and rack mount power systems. These products play a vital role in ensuring reliable and dependable power sources to the telecom industry. Telecom operators rely on our products to maintain their networks' stability, efficiency, and reliability.

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LPI Cables 940

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Westford, MA 01886
Phone: 978-392-7985
www.lpicables.com

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Maverick Corporation.....633

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www.maverickcorporation.com

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Future Network Flexibility

MaxCell.....1327

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Wadsworth, OH 44281
Phone: 717-881-9246
www.maxcell.us

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Millennium offers end-to-end solutions from the development to deployment of broadband networks. As a national broadband network solutions provider, we provide a host of resources from introducing new technologies that make networks more reliable, feasibility studies and supplemental engineering, managing projects and material needs, to the rental and leasing of capital equipment, and everything in between.

Milwaukee Tool419

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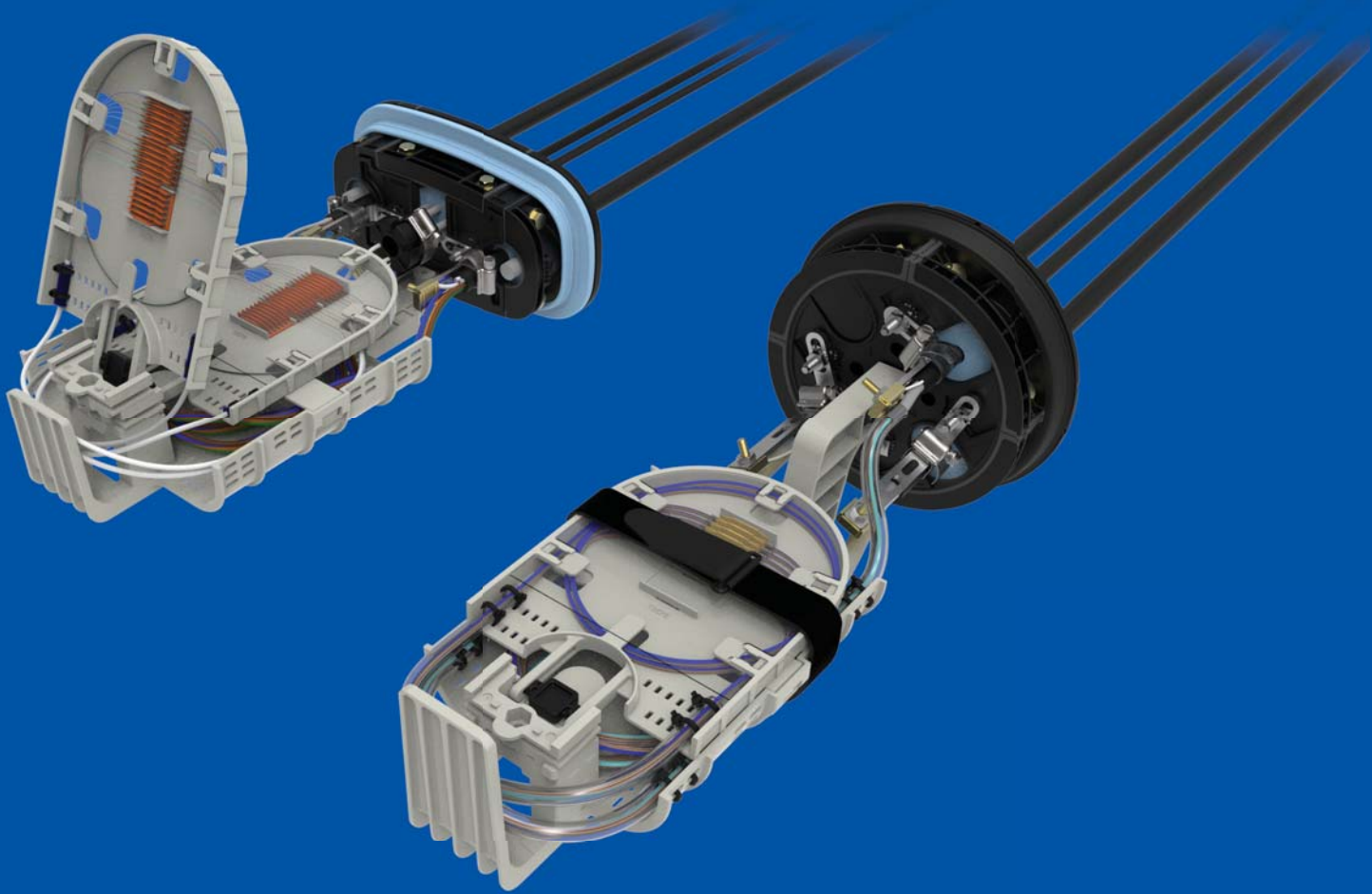
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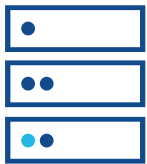
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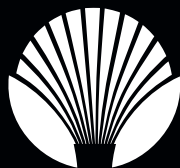
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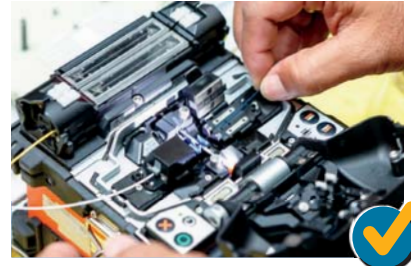
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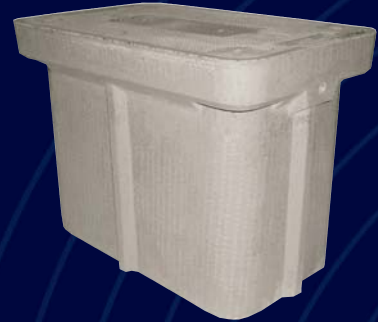
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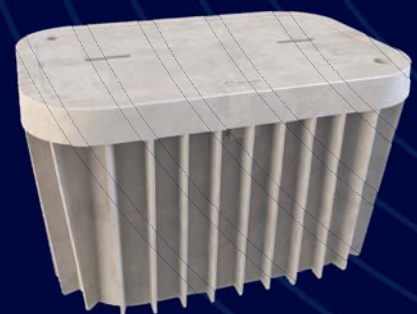
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Follow the Data to Reduce Underground Telecom Damages

BY ERIK ZIMMER & SPENCER KNOTT

According to the 2021 DIRT report¹ (Damage Information Reporting Tool), over 90,000 reported damages occurred to underground telecommunications and cable TV lines in the United States alone. The total number of damages has risen significantly since 2019, and the total estimated cost in the US of these damages exceeded \$350 million.

While damages to underground telecommunications lines don't pose the same danger or financial impact as damages to gas utilities, the costs of labor, materials, litigation, and time to repair these facilities adds up quickly. When you factor in additional societal costs such as loss of emergency and 911 services or business closures, the true cost of these damages is exponentially greater.

Increased construction spending has consistently proven to correlate with an increase in damages, and the 39 million+ locate requests in 2021 was an increase of 8%. The 2023 DIRT report will be published this fall and the numbers are likely to increase again as funding from the Infrastructure Investment and Jobs Act directed to communities across the US, will continue to stress an already inundated damage prevention system.

An article from December 2022 by United Cooperative Services² estimated that their members and contractors severed 35-40 fiber optics lines *per week* in 2021 and approximated their average cost to repair large fiber optic cables to be between \$15,000-\$20,000.



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To avoid these costly incidents, facility owners should understand the root cause of previous damages and take proactive steps to prevent them in the future.

Digging Into the Data

According to the DIRT report, 68% of all damages to underground telecommunications utilities is due to three root causes (See Figure 1.):

- Locate error (33%)
- No notification made to 811 Center (21%)
- Excavator failed to pothole/maintain clearance (14%)

Best Practices Reduce the Risk

Investing in effective marking tools and utilizing best marking practices can proactively combat these causes head on, and better protect underground assets.

1. REDUCING LOCATOR ERROR

Utility locators receive the brunt of the blame from the damage prevention world. They work long hours under tight deadlines and face the increasingly high demand for utility locates. Private utility locate companies battling nationwide staffing issues only compound the stress.

Fortunately, there are innovative tools that can assist locators in performing their duties with increased accuracy and efficiency.

Tracer Wire: One best practice is installing a tracer wire directly above telecommunications lines when they are installed. This tracer wire system should be corrosion, moisture, chemical, oil, impact, crush, and abrasion resistant. Many organizations already include the use of tracer wire in their specifications, and more states are pushing to legally require all underground utilities to install tracer wire with their assets.

However, not all tracer wire is created equal. Use of an extra high-strength copper clad steel (CCS) wire is typically preferred. CCS wire is not only cheaper, but also stronger than standard copper wire. It can provide locators a more accurate read on the location and depth of a company’s buried assets.

Test Stations: Often, tracer wire is poorly maintained or exposed to the elements. An aboveground test station can protect both the tracer wire and access terminals from severe weather and vandalism.

Flush mounted test stations can be mowed over while still providing a visible warning, and they’re ideal for areas where aboveground test stations are not practical. It has a telescoping terminal board for quick access to the tracer wire. An added benefit of test stations is they provide a visible warning message about the presence of the facility 365 days a year.

Hardware: Locating multiple utility lines can become a tedious task for the locator—having to locate lines separately and continuously reconnect to the different terminals significantly slows down their process.

Today, hardware exists that can be added onto a test station that enables the locator to “shunt” the connection and connect to all the facilities at once. Shunting or jumping each one of the laterals with the ground allows the locator to connect to the ground as well as any one of the four terminals that go to the laterals.

Ground: Grounding anodes should be installed at all dead ends of the tracer wire system to complete the electrical circuit needed to enhance signal for locating purposes. Grounded tracer wire allows the locator to use a lower frequency which provides the most accurate results for locating. Using a higher frequency tends to bleed-over into other buried utilities, making the locate inaccurate.

The best way to ground a tracer wire system is to install a 1.5-pound drive-in magnesium ground rod and an access point at each tracer wire dead end. An access point will protect the wire and provide a direct connection point for a utility locate transmitter to connect to the tracer wire. It also provides a connection point for the ground rod wire and allows the ground connection to be turned on and off, allowing you to control the signal on the target line.

Connectors: A tracer wire system is only as good as its weakest connection. It is vital to use connectors that are water and corrosion-proof to protect vulnerable wire splices and keep the locate signal flowing across connections.

Using cheap alternatives like electrical tape will result in corrosion. A corroded connection point can cause the locate signal to stop at the connection point, making the rest of the buried utility unlocatable, which could end in disaster for the excavator.

2. CONTINUING TO INCREASE AWARENESS FOR 811

Failure to request a locate continues to be the largest root cause of damages to underground facilities, accounting for 25% of all reported damages in 2021. While 811 awareness continues to rise every year, thanks in large part to nationwide marketing campaigns and industry-wide education initiatives, the overall use of the system varies widely.

While we recognize excavators are aware of 811, the system is not used consistently enough, and our educational efforts may need to point towards understanding instead of awareness alone.

In 2018, the CGA conducted a nationwide survey³ of excavators asking the reasons behind their decision to not request a locate ticket. The top three responses were:



FIGURE 1. Leading root causes of damages to underground telecommunication lines, according to the 2021 DIRT report.

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FIGURE 2. Essential tools to create a Complete Damage Prevention System.

- Belief the project was in an area that didn't need marking (30%)
- Belief that they were already aware of location of buried utilities (29%)
- Assumed they weren't digging deep enough to hit utilities (23%)

Deploying aboveground markers and signage all along your utility ROW can increase public awareness of the presence and approximate location of a buried utility. In many instances, the excavator simply didn't see any marker in the vicinity, and just assumed the area was clear.

3. LAST LINES OF DEFENSE

Even when the locate requests are made ahead of time, the utilities are located correctly, and they are marked accurately, there are still times human error cannot be avoided.

Failure to maintain clearance accounted for nearly 6,000 telecommunication damages in 2021, and that number is expected to increase in the upcoming fall report.

Underground warning tape is made of a brightly colored, non-adhesive polyethylene material that is buried above underground utilities and serves as a warning to excavators that they are approaching a buried facility. It is a simple and cost-effective tool that can act as a last line defense for the buried asset. (See Figure 2.)

A Complete Damage Prevention System

When facility operators utilize the tools reviewed in this article, they will build what Rhino Marking & Protection

Systems calls "A Complete Damage Prevention System": strategically deployed marking products designed to increase public awareness, improve utility locate accuracy, and mitigate 3rd party damages to underground assets.

As the industry continues to put more and more assets underground, it is important that all facility owners do their part in mitigating damages to those buried assets. The sole responsibility for damage prevention cannot be put on excavators. Damage prevention is a shared responsibility across all stakeholders in the telecom construction ecosystem. ■

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