

DECODING CONNECTIVITY INFRASTRUCTURES: LEGACY VS. GREENFIELD

**The Pitfalls of Connecting with
a Provider in Maintenance Mode**

INTRODUCTION

Businesses in all industries rely on a vast network of infrastructure systems — from roadways, railways, ports and bridges to electrical grids and internet connectivity — that are designed to provide greater access and efficiency across the United States.

Most of these infrastructure systems were built decades ago and, in some cases, are 50 to 100 years old. The passage of time coupled with inadequate investment has led to the deterioration of these legacy systems. In turn, these neglected services fall short of meeting the demands created by today's economy — which mandates quick and efficient access to resources that, in many cases, have been digitally transformed.

Notably, the [2021 Report Card For America's Infrastructure](#)¹ by the American Society of Civil Engineers gave infrastructure in the United States a grade of C- amid a \$2.59 trillion shortfall in infrastructure spending.

Let's focus on telecom infrastructure. While the nation invested [\\$80 billion](#)² in telecom infrastructure in 2018, it's no wonder a more modern category such as broadband connectivity could be overlooked compared to much older infrastructure categories that are in dangerous states of disrepair, such as dams and transit systems.

Legacy telecommunications companies laid the foundation for the telecom industry using copper and coaxial cables. These businesses first were impacted by deregulation — which led to a number of mergers

and acquisitions across the industry — and now face high operating costs due to the [maintenance of legacy products](#)³ and infrastructure that have been broken and cobbled back together.

These expenses, along with investment in vertical integration areas such as streaming services, result in less capital investment and, ultimately, limits carriers' opportunities to improve their networks.

In stark contrast, today's businesses require high-capacity, low-latency connectivity options more than ever. According to analyst firm Statista, [business internet traffic](#)⁴ **in the U.S. is expected to reach 224 exabytes of data in 2023, a staggering 397% increase from 45.1 exabytes in 2016.**

In this executive brief, we will explore why legacy telecom infrastructure is woefully unprepared to satisfy an enterprise business's need for high-capacity connectivity, its risk to the enterprise, and introduce newly built, greenfield fiber networks as the solution.

LEGACY NETWORKS

For the purposes of this brief, we will define providers' legacy networks as those that utilize components that predate the advent of the World Wide Web (circa 1993).

Whether data moves over a coaxial cable or fiber connection, and is transmitted using electricity or light, the race to obsolescence for legacy telecom infrastructure in the United States accelerates with nearly every connectivity advancement.

Unfortunately, when you take a deeper dive, you realize the answer to why is multifaceted, as outlined in [“Why is the American Internet Empire Crumbling.”](#)⁵

To start, both public and private funding decades ago established the United States as the first country to invest in a network infrastructure at scale. But, due to a subsequent lack of continued investment and upgrades, the U.S. is facing outdated networks and aging infrastructure. Meanwhile, other developed countries have built out their digital infrastructures from scratch on mature fiber technologies thanks, in part, to our trial-and-error.

The vast, physical geography of the United States also challenges legacy network providers because upgrading existing infrastructure to fiber is both expensive and variable. Similarly, two of the leading cost considerations when connecting a building are its physical distance from the network as well as any local regulations that must be upheld.

The latter changes from one city to the next and leads to the final issue: politics. From a regulatory perspective, the United States generally is more relaxed than other developed countries. As a result, the policies that do exist tend to be outdated, minimizing conditions that might compel providers to compete directly.

The Patchwork Problem

As the telecom industry has evolved, so too has its complexity. Unfortunately, legacy networks also carry a history rich with accumulated asset fragments that have been patched together over time. This has created a host of obstacles. Notably:

- **Age:** A provider's network is not a fine wine. A network built 30 years ago simply cannot support an enterprise's technological needs today without a significant and intensive investment of capital and time.
- **Equipment:** A legacy network's equipment may be two or three generations older than what is available on the market, and struggle to keep pace with demand. Moreover, to prevent signal degradation, some providers install additional equipment along the route to boost the signal, which can increase latency.
- **Efficiency:** Over time, repairs and patches can increase the risk of packet loss. Compounded over a few decades, these modifications can disrupt efficient data transmission, resulting in errors or missing data. Effectively, data sent over a legacy network may take the best path of least — or most — resistance, instead of the path that was purpose-built for its transmission.

Finally, provider consolidation resulting from mergers and acquisitions throughout the telecom industry have compounded these issues, rendering some organizations unable to pinpoint exactly where their merged network assets are located. Often, inherited assets lack critical documentation such as network route maps, capacity and fiber strand-count per sheath, which makes updating these combined infrastructures even more complicated. **And who suffers? The enterprise.**

The Impact to the Enterprise

Enterprise organizations rely on their networks to manage business-critical applications, transfer information across multiple office locations and perform data storage and replication. Thus, they need service providers that can keep up — proactively enhancing their technology and networks to deliver optimal service levels. If a provider is unable to maintain its network due to a lack of information or unwilling to do so due to fractured and competing resources, enterprise organizations ultimately pay the price for their legacy service providers' inaction.

An outdated infrastructure can slow down a company's productivity considerably. [Riverbed Technology](#)⁶, a provider of network infrastructure, found 93% of the 1,000 IT decision makers it surveyed reported that their organizations experience cloud-related network issues caused by legacy infrastructure at least once a month. More than half (58%) experienced cloud-related network issues a few times a month. When employees find it difficult to access data or key applications, frustrations rise, and productivity levels drop.

Network outages can have a fatal impact on a business. According to [Avaya](#)⁷, 77% of companies lose revenue

when network downtime occurs. While the true cost of a network outage is widely variable by company size and industry, [Gartner](#)⁸ estimates the cost to be \$5,600 per minute, or \$336,000 per hour.

And when the need to upgrade is imminent, businesses utilizing legacy network circuits often find the length and expense of the upgrade process to be prohibitive. Given the sheer scale and complexity of a legacy infrastructure upgrade, it is not uncommon for a business to accept its subpar connectivity over an upgrade's certain disruption to the operation.

Given the risk that legacy networks pose to the enterprise, let's turn now to the proposed solution: greenfield fiber networks.



GREENFIELD NETWORKS

Greenfield networks are defined as those composed of new, original fiber and equipment. In addition to new components, they are built from scratch and are managed using current technologies.

With the passing of time, modern service providers and network operators understand that business requirements have evolved. Simply providing a connection is no longer enough. Instead, businesses want networks that are designed to serve needs they don't even have yet.

Greenfield service providers are building and investing in new fiber infrastructure today are prepared to deliver purpose-built networks with maximum scalability to accommodate future connectivity advancements — designing their networks for the next 30-plus years rather than settling for what's been the status quo for decades.

Specifically:

- **Age:** Select fiber service providers are designing and building thousands of route miles of new fiber annually. The network infrastructure being built today is laying the foundation to accommodate the bandwidth capacity and technology that is on the horizon, such as 400 Gbps, 800 Gbps and even 1.2 Tbps backbone capacity.
- **Equipment:** Innovations in equipment elevate the quality of the mechanisms that transport data. When compared to the fiber and equipment used 30 years ago, the equipment produced today has the benefit of decades' worth of technological advancements. From the splicing and testing equipment used to the pole attachments and pipes in the ground, today's equipment is designed to accommodate increasing bandwidth requirements and maximize throughput — making it technologically equipped to scale as demand rises.
- **Efficiency:** Increasingly, enterprise organizations are discovering how much latency can impact their network and why low-latency connections are critical to business operations, data replication and the use of real-time applications. In some instances, greenfield network providers offer the advanced technology and equipment to deliver connections with less than 5 milliseconds of latency — maximizing the efficiency of the connection.

Today's greenfield fiber network service providers — defined as those actively building and densifying new fiber infrastructure — have the ability to precisely catalog where their routes are located, track how their networks are built and record how they are being enhanced, creating institutional knowledge with each install or improvement.

Greenfield fiber network providers leverage software that not only makes it easier to plan, track and monitor today's network builds, the process also is light-years ahead of how it was handled decades ago when legacy infrastructure was built.

By owning, operating, constructing and maintaining a newly built network, today's greenfield fiber service providers can harness the power of information available right at their fingertips. This knowledge, in turn, benefits customers as providers are able to confidently deliver a superior customer experience.

Greenfield fiber network service providers are building these new networks with high-speed, low-latency connections running over properly constructed fiber optic infrastructures. Many of these providers are also leveraging automation and artificial intelligence to make the network smarter, improving performance. And, if there is an issue, network operations engineers are well-positioned to resolve it and communicate effectively with customers.

The Bonus of Fiber Density

Deloitte reports that despite the demand and potential economic benefits of fiber deployment, the United States lacks the dense fiber networks necessary to make the bandwidth advancements to improve the pace of innovation and economic growth.³

Simply put, density — whether defined as increased fiber count, equipment designed to maximize throughput, or extending fiber routes deeper into communities — yields increased capacity and performance while using less space.

With a new fiber network build, greenfield fiber service providers can utilize today's improved fiber and equipment assets to install more fiber in a smaller footprint, which streamlines the upgrade process. Legacy providers may not be able to accommodate an upgrade without the expense and delay of construction, for example, whereas many greenfield fiber providers can complete capacity upgrades within minutes over the phone.

Finally, fiber density increases connectivity options and access for businesses, which stand to gain greater route diversity and improved options for cloud and disaster recovery strategies. It also supports the infrastructure needed for wireless and promotes competition, making it a critical economic driver. Greenfield fiber service providers contribute in each of these areas by investing in new fiber networks capable of meeting these next generation demands.

A photograph of two women sitting at a desk, looking at a laptop. The woman on the left has short brown hair, wears glasses, and a dark blue sleeveless top with a white floral collar. The woman on the right has long brown hair and is wearing a light-colored top. They are both smiling and appear to be in a collaborative work environment. A purple-bordered box on the left side of the image contains the text 'FOCUS ON MINDSET'.

FOCUS ON MINDSET

Legacy Providers: Maintenance Mindset

Legacy service providers often operate with a maintenance mindset. To keep the network operational, they may address known problems or patch holes periodically; however, many of these providers are not investing in growing and upgrading their networks.

Whether there are multiple layers of legacy infrastructure due to one or more acquisitions or increased latency and inefficiencies because of such consolidations, service providers in a maintenance mindset are prone to obstacles that often consume time and resources.

Greenfield Providers: New-Build Mindset

As fiber networks have emerged as the leading choice for enterprise businesses, fiber service providers with a new-build mindset are nimble and forward-looking. New fiber networks are stronger, faster and more resilient with a level of versatility and sophistication that is unmatched when compared to legacy connectivity options — including other fiber networks.

Greenfield providers' fiber networks offer new equipment with inherent scalability for a business's ever-increasing capacity needs plus improved technology to address maintenance updates and reduce the risk of an outage. Service providers with a new-build mindset deliver the scalable, high-capacity infrastructure to meet the needs of today's enterprise business customers — with the inherent benefits of a "new" network as a true differentiator.

CONCLUSION

Just as networks have changed in the past 50 years, so too have the enterprise businesses relying on these networks. Enterprise businesses expect a network that is up all the time — always on; always ready; always accessible. Despite this expectation, enterprises are often left scrambling without the level of support or answers they need in today's "always on" business environment.

Greenfield fiber providers like Everstream are investing in a new fiber infrastructure to support the demands of growing enterprise businesses while also fostering an environment that thrives on ensuring customers get what they need to succeed.

When compared to the benefits of a new fiber network for an enterprise customer, legacy networks can't keep up. When a new fiber network also is packaged with a network service provider equipped with experienced, tenured professionals, local teams, and an engrained sense of accountability, legacy providers simply can't compete.

Citations

¹ American Society of Civil Engineers. (2021, February). *2021 Report Card For America's Infrastructure*. <https://infrastructurereportcard.org/>

² USTelecom The Broadband Association. (2020, April). *USTelecom Industry Metrics & Trends 2020*. <https://www.ustelecom.org/wp-content/uploads/2020/02/USTelecom-State-of-Industry-2020.pdf>

³ Deloitte. (2017, July). *Communications Infrastructure Upgrade: The Need for Deep Fiber*. <https://www2.deloitte.com/content/dam/Deloitte/us/Documents/technology-media-telecommunications/us-tmt-5GReady-the-need-for-deep-fiber-pov.pdf>

⁴ Statista. (2020, June 9). *Business internet traffic volume in the U.S. 2016–2023*. <https://www.statista.com/statistics/995060/business-internet-traffic-in-the-us/>

⁵ Cooper, T. (2020, December 15). *Why Is the American Internet Empire Crumbling?* BroadbandNow. <https://broadbandnow.com/report/why-is-the-american-internet-empire-crumbling/>

⁶ Riverbed. (2017, September 20). *Riverbed Future of Networking Survey Finds Legacy Networks Holding Back Cloud and Digital Transformation* [Press release]. <https://www.riverbed.com/nl/press-releases/riverbed-future-of-networking-survey-finds-legacy-networks-holding-back-cloud-and-digital-transformation.html>

⁷ Avaya. (2015, February 4). *Network Downtime and Complexity Results in Job and Revenue Loss plus Missed Business Opportunities* [Press release]. <https://investors.avaya.com/investor-news/news-release-details/2015/Network-Downtime-and-Complexity-Results-in-Job-and-Revenue-Loss-plus-Missed-Business-Opportunities/default.aspx>

⁸ Lerner, A. (2014, July 16). *The Cost of Downtime*. Gartner. <https://blogs.gartner.com/andrew-lerner/2014/07/16/the-cost-of-downtime/>

About Everstream®

Everstream has raised the bar for business connectivity, delivering a business-only fiber network with the speed, reliability, scale and performance that today's enterprises demand. With more than 25,000 route miles of fiber and speeds up to 100 Gbps, Everstream's enterprise-grade network delivers robust business fiber services, including internet, WAN, data center connectivity and dark fiber. Through its "Do What You Say You Will Do" approach, Everstream is a valued partner dedicated to the success of business customers.

For more information, visit everstream.net.