

From the Ground Up

Private equity's role in infrastructure

NOVEMBER 2022

Data provided by

PitchBook



Executive summary

The US infrastructure system is a sprawling network of roads, bridges, terminals, and communication towers that allows the country to function every minute of every day. Much of this network is out of sight. Thousands of miles of fiber-optic cables are on the ocean floor or under city sidewalks. Cell towers can be miles away, but texts are still delivered in a fraction of a second.

Even farther out of sight is the private equity (PE) industry, which quietly helps finance new infrastructure projects from coast to coast. Some of the brightest minds in infrastructure work in specialized PE firms that invest in long-term, complex projects—investments that often span a decade or more. In some cases, PE firms can help local and state governments that are facing budget shortfalls. In recent years, PE firms have financed cell towers, wastewater management systems, and even entire airports. Infrastructure investing requires regulatory know-how, precise planning, and lots of capital. Today's PE firms have all three.

In conjunction with PitchBook, this report highlights PE's contributions to the US infrastructure system over the past decade. Beyond the billions of dollars invested, PE also helps de-risk key infrastructure projects at the outset. Renewable energy projects, for example, involve risky developmental costs once they're approved, and PE firms bake these costs into their plans.

They also back these projects for the long haul, and policymakers can help incentivize long-term investments. The CHIPS and Science Act, for example, helped spur a new \$15 billion partnership between Intel and AIC member Brookfield Infrastructure Partners to build expanded chip manufacturing facilities in Chandler, Arizona. The new partnership is being called a "semiconductor co-investment program" and will provide a blueprint for other financial partners and manufacturers to create similar initiatives. The CHIPS for America program, an offshoot of the legislation that will be administered by the Commerce Department, is providing \$50 billion from the CHIPS Act to help re-energize semiconductor production and attract private capital for the effort.¹ The bipartisan Infrastructure Investment and Jobs Act (passed in 2021) and the Inflation Reduction Act (passed in 2022) will provide similar incentives for long-term, infrastructure-focused PE investments in the years ahead.

- Executive summary
- Patient capital
- Transportation
- Clean tech
- Telecom
- Q&A with Grain Management

¹: ["Biden Administration Releases Implementation Strategy for \\$50 Billion CHIPS for America program," U.S. Department of Commerce, September 6, 2022.](#)

Patient capital

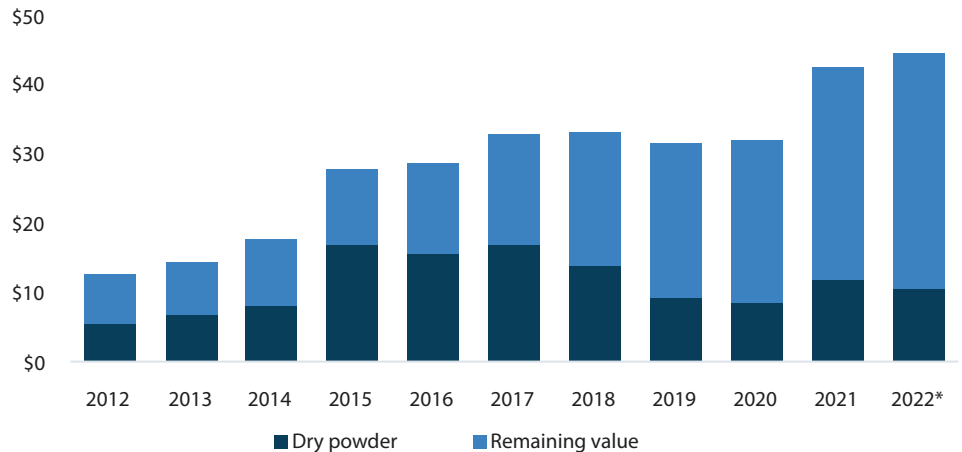
Today, PE manages almost \$45 billion of capital earmarked for infrastructure investments. A decade ago, that number was less than \$15 billion. Where did all that money come from?

In recent years, PE has expanded into a long-term, patient capital provider for US infrastructure projects and service providers. As a result, almost \$180 billion of PE dollars have flowed into US infrastructure over the past decade. The Infrastructure Investment and Jobs Act, signed into law in November 2021, will allocate more than \$500 billion to new projects over the next five years, which will entice more PE dealmaking in the near term.

Institutional capital, including PE, is a deliberate and patient source of financing that continues to grow every year. PE firms hire some of the most knowledgeable experts in the infrastructure field, and those experts can act nimbly and offer assistance to overwhelmed bureaucrats. PE is a natural fit for public-private partnerships and has helped state and municipal governments stay on schedule while reducing the burden on taxpayers.

PE's capabilities stretch well beyond traditional infrastructure projects such as roads and bridges. Today's investors are helping cutting-edge technology companies build hyperscale data centers, cloud infrastructure security systems, innovative microgrids, and other mission-critical facilities throughout the country.

US infrastructure PE AUM (\$B)



Source: PitchBook | Geography: US
*As of June 15, 2022

Representative infrastructure projects and service providers backed by private equity



Underwater transmission lines
Hyperscale data centers
Cloud infrastructure
Cell towers
Microgrids



Airport terminals
Marine terminals
Cargo handling
Railways



Wind projects
Solar farms



Water treatment facilities
Waste management/landfills

Patient capital

Over the past decade, PE has invested more than \$180 billion in the US infrastructure system, spanning hundreds of investments, blueprints, and long-term partnerships. Some investors, such as Global Infrastructure

Partners, DigitalBridge Group, and I Squared Capital, are dedicated to infrastructure investments. Other investors, such as AIC members KKR, Apollo Global Management, and Blackstone, have formed dedicated

infrastructure teams capable of investing billions of dollars into future projects. Infrastructure funds have become very popular in recent years, attracting new capital and ensuring a strong base of financing in the years ahead.

Private equity at work



The CPV Fairview Energy Center is a massive power generation facility in Jackson Township, Pennsylvania. Its total capacity tops 1,000 megawatts and can supply electricity to 1 million homes and businesses in Pennsylvania. AIC member Apollo Global Management made a significant investment in CPV Fairview in 2018 and over four years led the state-of-the-art effort, which helped Pennsylvania lower its energy costs and emissions output while meeting the state's energy demands. When it was sold to its new owners in 2021, CPV Fairview had become "one of the most efficient gas units in the PJM-MAAC region"² and had created almost 100 full-time or ancillary jobs (it involved more than 600 union labor workers while under construction).³

THE NEW TERMINAL ONE

JFK INTERNATIONAL AIRPORT

With the help of PE, John F. Kennedy International Airport is getting a brand-new terminal. AIC member The Carlyle Group, alongside JLC Infrastructure, Ferrovial, and Ullico, is financing New Terminal One, a 23-gate terminal that will be the largest in the airport at 2.4 million square feet. Once completed, the terminal is expected to attract 10,000 new jobs—including 6,000 construction jobs—with a goal of having 30% of new businesses be minority- or women-owned.^{4,5} Construction starts in late 2022, with union labor under contract for building the new terminal, and the project is expected to be finished by 2030.

²: ["DL Energy to Acquire Minority Stake in CPV Fairview Energy Center from Apollo Infrastructure," GlobeNewswire, December 16, 2021.](#)

³: ["CPV Fairview Energy Center," Competitive Power Ventures, n.d., accessed August 11, 2022.](#)

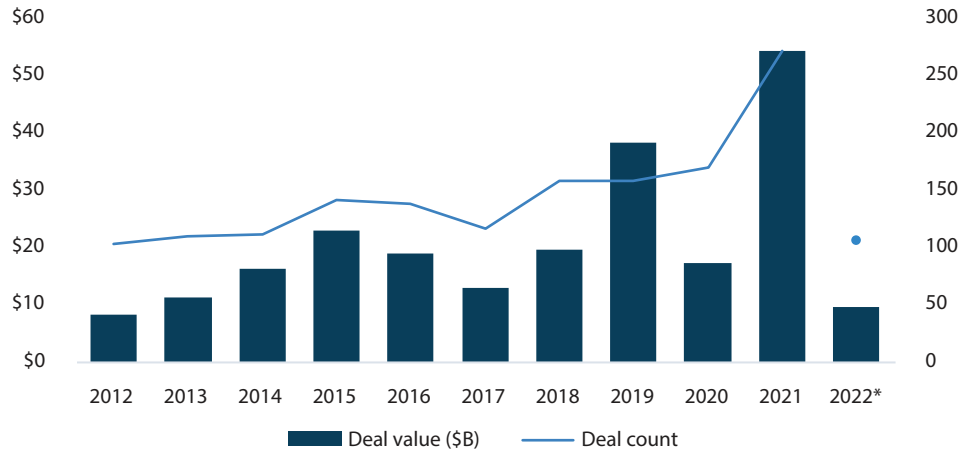
⁴: ["Carlyle, Together with the Consortium Building the New Terminal One at JFK Airport, Announce Completion of Development Phase, Provide Notice to Proceed on Construction," The Carlyle Group, June 10, 2022.](#)

⁵: ["New Terminal One to Transform JFK International Airport with World-Class, \\$9.5 Billion Facility," A Whole New JFK, December 13, 2021.](#)

Transportation

According to PitchBook, PE firms have invested more than \$220 billion in almost 1,500 US transportation companies over the past decade. PE firms have sponsored ports, marine terminals, airports, highways, and railways, among other things. Behind dozens of points in the US supply chain, PE sponsors are upgrading hundreds of companies and financing shovel-ready infrastructure projects without much fanfare. Beyond the projects themselves, PE capital has supported the companies and service providers that maintain that infrastructure once it is built.

US transportation PE deal activity



Source: PitchBook | Geography: US
*As of June 15, 2022

Beyond financing new terminals, marine ports, and toll roads, PE firms are just as active in keeping the supply chain operating efficiently. PE sponsors have invested in a significant number of logistics and supply chain-related companies over many years. AIC members Blackstone; Providence

Equity; Welsh, Carson, Anderson, and Stowe; and ArLight Capital Partners have all made large investments in logistical service providers, including large properties dedicated to logistical

uses, global shipping platforms, supply chain risk management providers, and bulk liquid storage facilities.

Private equity at work



Atlantic Aviation is a fixed-base operator (FBO) network that supports the US airline industry. FBOs de-ice planes, refuel them, guide planes into place once they land, and perform a wide range of aircraft handling and support services. Atlantic became the second largest FBO network in the country after partnering with Macquarie Asset Management in 2004. Atlantic CEO Lou Pepper called Macquarie “a fantastic partner” and credited the firm for the explosive growth Atlantic has enjoyed for 17 years.⁶ In 2021, AIC member KKR partnered with KSL Capital Partners to take Atlantic on a new growth phase and aims to make Atlantic an industry leader in safety, sustainability, and technology.⁷

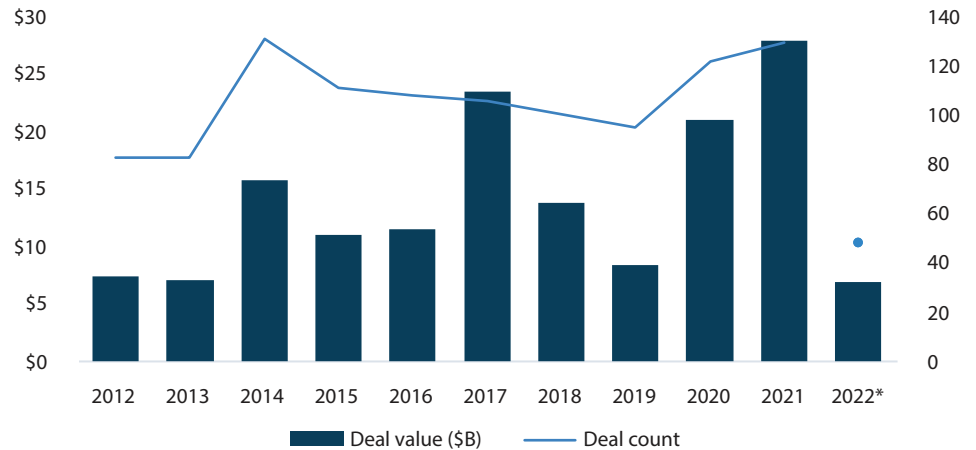
6: “Atlantic Aviation Sale Closes,” *Aviation International News*, Curt Epstein, September 27, 2021.

7: “Atlantic Aviation and Ross Aviation Announce Agreement to Combine FBO Networks,” *Business Wire*, November 16, 2021.

Clean tech

Thanks to innovation in the space, clean-energy technology has earned its place as a contributor to the US infrastructure system. PE is a longtime supporter of the industry, investing around \$150 billion into more than 1,100 clean tech companies and projects over the past decade. Solar, wind, hydroelectric power—the list of case studies is long and growing. According to PitchBook, last year was a record year for capital invested, with \$28 billion in deals. Combined with 2020, almost \$50 billion of PE capital has been funneled into clean tech applications and providers.

US clean tech PE deal activity



Source: PitchBook | Geography: US
*As of June 15, 2022

With permits in hand, the Biden administration is opening public lands for new clean energy generation. The administration is also rolling out the Make More in America Initiative, which is addressing long-term weaknesses in the US supply chain that were exposed by the COVID-19 pandemic.

Implemented by the Export-Import Bank, the initiative includes new financing tools and programs aimed at infrastructure and clean energy-related businesses,

including renewable energy projects, energy storage companies, and biotech and biomedical products.⁸

Private equity at work

AlphaStruxure

AlphaStruxure is the brainchild of AIC member The Carlyle Group and Schneider Electric. Formed by a joint partnership in 2019, AlphaStruxure is an energy-as-a-service provider that creates customized energy solutions, with an emphasis on microgrid technology, for its clients. With Carlyle's capital and Schneider's expertise, the company's first big project was the Brookville Smart Energy Bus Depot in Montgomery County, Maryland, which successfully integrated microgrid technology with electric vehicle charging infrastructure. As a result, 70 buses in the Montgomery County public transportation system are transitioning from diesel to electric, and the projected drop in lifetime emissions for those vehicles is more than 160,000 tons. The bus fleet, which is coming online later this year, "marks a major milestone for the industry" and provides a blueprint for other counties and cities to follow going forward.⁹

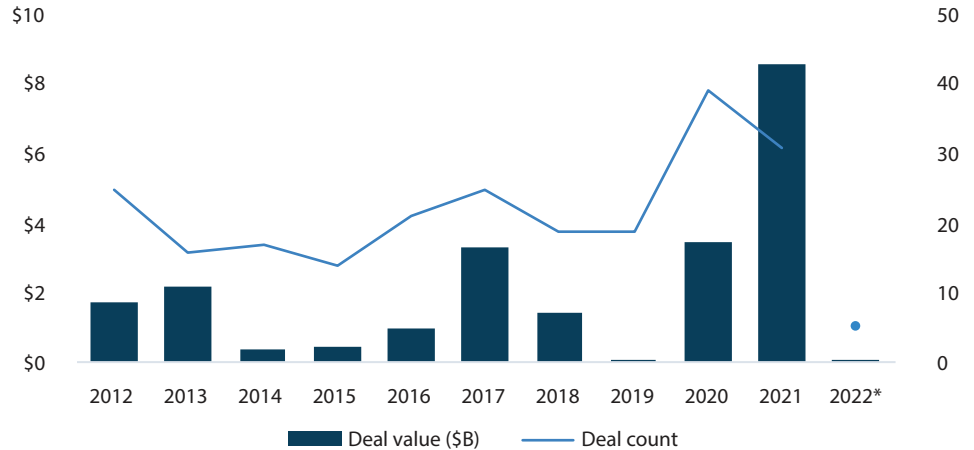
8: "Make More in America Initiative," Export-Import Bank of the United States, n.d., accessed September 14, 2022.

9: "AlphaStruxure," The Carlyle Group, n.d., accessed August 10, 2022.

PE sponsors have made deliberate efforts to expand broadband internet access to underserved rural communities. Last summer, AIC member Apollo Global Management bought a large piece of Lumen Technologies' incumbent local exchange carrier network for \$7.5 billion. The acquired network included almost 60,000 fiber customers across 20 states, including Kansas, Missouri, Arkansas, and Indiana.¹⁰ Apollo's Aaron Sobel emphasized "the urgency and importance of providing faster, more reliable internet connectivity to bridge the digital divide, particularly in rural and suburban America." Another example: This past June, AIC member GTCR invested in Visionary Broadband, a hybrid fiber and wireless network based in Wyoming. GTCR's investment will help Visionary construct new networks throughout Colorado and Montana.¹¹

PE has also been very active in the semiconductor industry and is helping the US regain its standing as a leading chip manufacturer on the global stage. In 2016, AIC member Marlin Equity Partners

US telecom PE deal activity



Source: PitchBook | Geography: US
*As of June 15, 2022

helped create a new chip manufacturer, called Elenion Technologies, from scratch. Before unveiling it, Marlin kept the new company under wraps for two years, doing extensive research and development alongside another Marlin company called Coriant. Marlin put in

place a promising executive team led by 25-year veteran Larry Schwerin, who helped develop Elenion into a large source of semiconductors for the US telecom sector.¹²

Private equity at work



US chip manufacturing has long been at the forefront of semiconductor innovation. The United States' advantage has waned in recent years, especially from Taiwan and South Korea, but worldwide demand for cutting-edge semiconductors is expected to go up. That's why AIC member Brookfield Infrastructure Partners pledged up to \$15 billion in August 2022 to finance Intel's manufacturing expansion in Chandler, Arizona. It's a novel partnership that Intel is calling a "semiconductor co-investment program," or SCIP, that could catch on with other manufacturers.¹³ Brookfield's capital will help underpin Intel's balance sheet and allow the manufacturer to protect its capital for future investments. Brookfield CEO Sam Pollock says the investment "will form part of the long-term digital backbone of the global economy." Intel CFO David Zinsner credited the recently passed CHIPS and Science Act for building the momentum for the idea to become a reality.

10: "Lumen sells CenturyLink ILEC assets to Apollo in \$7.5 billion deal," RCR Wireless News, Catherine Sbeglia Nin, August 5, 2021.

11: "Wyoming's Visionary Broadband gains investment from GTCR private equity fund," Fierce Telecom, Dan O'Shea, June 7, 2022.

12: "Marlin Unveils Elenion Technologies," Marlin Equity Partners, December 14, 2016.

13: "Intel Advances Smart Capital, Introduces First-of-its-Kind Semiconductor Co-Investment Program for Manufacturing Build-Outs," Intel, August 23, 2022.

Private equity at work



TRAC Intermodal, based in New Jersey, is a PE-sponsored intermodal infrastructure provider. The owner of the biggest fleet of marine chassis in North America, TRAC partnered with Stonepeak for its new phase of growth in March 2020. Marine chassis help facilitate shipping container movement at major trading posts and port terminals throughout the country. TRAC, in partnership with Stonepeak, is finding opportunities to improve its fleet of 500+ chassis locations to keep up with e-commerce trends and the growth of express delivery, including private chassis fleets for expedited shipments.¹⁴



Based in Columbus, Ohio, Star Leasing is a regional trailer lessor that operates throughout the Midwest and Southeast. With a fleet of 19,000 trailer rentals, Star Leasing can expand its footprint thanks to I Squared Capital, a global infrastructure investor. Earlier this year, I Squared Capital brought Cooling Concepts, a refrigerated trailer leasing company, into the fold. Star Leasing CEO Steve Jackson said I Squared Capital's partnership will allow the company to better serve its existing customers and position itself as a one-stop shop for its clients in the years ahead.¹⁵



It doesn't get talked about enough, but cold food storage plays an important role in getting our country fed. Based in Novi, Michigan, Lineage Logistics is the biggest temperature-controlled logistics company in the world. Backed by Bay Grove for more than a decade, Lineage now operates more than 400 warehouses worldwide, including in a majority of US states. Several other PE firms are behind the effort, including Stonepeak, with the shared goal of building a key contributor and innovator within the global supply chain.¹⁶

14: "TRAC Intermodal," Stonepeak, n.d., accessed August 10, 2022.

15: "I Squared Capital Acquires Star Leasing, a Leading Trailer Lessor in the United States," Business Wire, March 24, 2021.

16: "Bay Grove," Lineage Logistics, n.d., accessed August 10, 2022.

Q&A with Grain Management

“Telecom is highly technical, and a disciplined, data-driven approach is required to predict growth and understand value.”

Tell us about Grain Management—what you focus on and what your background is as a firm.

Grain Management is a global solutions provider to the telecommunications industry. We create value through expansive sector knowledge, deep industry relationships, rigorous analytics, and a highly specialized team with unique industry expertise.

We deploy private capital through the acquisition of portfolio companies; investment in wireless spectrum; and the purchase or development of telecom infrastructure hard assets, such as cell towers and data centers.

The team at Grain Management leverages decades of experience and relationships operating in the telecommunications infrastructure sector to make successful investments aimed at generating differentiated returns for our investors.

Our investments at Grain Management facilitate infrastructure connectivity in the communities that they serve, providing essential services to the broadband industry.

What is telecommunications infrastructure and how does it relate to traditional infrastructure investment themes?

At a very high level, the assets that allow telecommunications networks to operate are considered telecommunications infrastructure. This includes fiber-optic broadband networks, cell phone towers, data centers, small cell networks, and increasingly edge networks that help better connectivity for the ubiquitous expansion of the Internet of Things. In the US, mobile data traffic is expected to increase about

8x over the next decade, driven by a considerable increase in mobile streaming video and rapidly expanding 5G use cases.

Given the importance of high-quality broadband access in our economy, significant investment into telecommunications infrastructure from both the private and public sector is required. Just like investments in traditional infrastructure like roads and bridges, telecommunications infrastructure is a critical investment for the future.

The recently enacted Infrastructure Investment and Jobs Act allocated more than \$65 billion to telecommunications infrastructure. How will these flows impact the industry?

The \$65 billion allocated to broadband infrastructure in the Infrastructure Investment and Jobs Act represents the largest federal government investment in broadband in history. Among other things, this bill will accelerate the United States’ transition to 5G, expand high-quality internet access to millions of Americans, and create thousands of jobs in the process. These investments are critical for US economic competitiveness and also promote economic and social inclusion for the underserved population.

At the highest level, federal authorities at the Federal Communications Commission and the Department of Commerce allocate these appropriated funds to the state level. Each state legislature is then responsible to adopt or modify legislation for the further allocation of funds to specific programs, obviously customized for the needs of their states. The private sector accesses these funds via grants to help drive the expansion of broadband services to underserved communities.



David Grain
Chief Executive Officer
and Founder

Mr. Grain is the C.E.O. and Founder of Grain Management. Before founding Grain in 2007, he served as President of Global Signal Inc. (formerly NYSE listed GSL). Mr. Grain led the predecessor company, Pinnacle Towers, from bankruptcy through its successful turnaround. He previously held senior positions at AT&T and Morgan Stanley.

Mr. Grain serves on the Board of Directors of Dell Technologies (NYSE – DELL), Southern Company (NYSE – SO), New Fortress Energy (NASDAQ – NFE) and the Board of Trustees of Brookings Institution. He is a member of the Advisory Council of the National Museum of African American History and Culture and a Lifetime Member of the Council on Foreign Relations.

Mr. Grain holds an M.B.A. from the Tuck School of Business at Dartmouth College and serves on its Board of Advisors. He holds a B.A. from College of the Holy Cross.

For the industry, these public funds are expected to accelerate the private sector's investment in telecommunications infrastructure. Grain Management helps our portfolio companies navigate the complexities of these funding programs through advice on timely application for funds, ensuring program compliance, and also helping manage the execution risk related to the build-outs.

How can an improved telecommunications network benefit parts of our population that are underserved by telecommunications infrastructure?

In the United States, an estimated 15 million people are still without access to high-speed internet. Unfortunately, many of these individuals live in lower-income, rural areas that have been historically underserved by larger telecommunications service providers. In today's economy, having limited to no access to high-speed internet puts people at a significant economic and educational disadvantage.

Job growth is driven by small and medium-size enterprises in the US, many of which are located in our small towns and rural areas. Communities without high-speed internet access find it relatively difficult to attract businesses and, maybe more importantly, to stop businesses from leaving, without competitive, cost-effective connectivity.

School-age children who live in areas without access to high-speed internet are at a significant disadvantage, as they are often unable to access educational material that requires the use of the internet. This issue was really brought to light with remote learning environments during the COVID-19 pandemic.

What does private equity bring to the table in telecom? Asked another way, what unique skillsets, benefits, and relationship networks can PE firms bring to their telecom portfolio companies?

At Grain, we work very closely with our portfolio companies to create value and support them in virtually every way possible. Telecommunications is a highly technical sector, and a disciplined, data-driven approach is required to appropriately predict growth and understand value. We provide our companies' management teams with access to operating partners and industry experts who can help them navigate myriad challenges relating to go-to-market strategies, network and technology, human capital, finance, the procurement of materials, and just about any other challenges they may face.

In addition, we work closely with our companies to stay ahead of the curve on regulatory matters. We want to help our companies understand how current and future regulations and legislation will impact their growth plans and also how to

capitalize on the opportunities that these regulatory matters present. Grain's presence in Washington, DC, as well as our decades of experience in dealing with policymakers, is particularly helpful to our portfolio companies.

Finally, we facilitate and encourage our companies to maintain an open dialogue and work with each other to share best practices and discuss how they are navigating the similar challenges that they are facing. We have received positive feedback and results from our portfolio companies around the support that we provide.

Is there a global dimension to Grain Management's focus on digital infrastructure?

Absolutely. We are now focused on the similarity in themes and opportunities arising from the expanding need for competitive digital infrastructure around the world. In the last couple of years, we made our first investment in non-US assets with our entry into Latin America. In addition to opportunities across the Americas, we are now focused on pursuing opportunities in Europe, Asia, and Africa.

In many of these markets, in addition to the need for capital and modernization, we see significant opportunities in industry roll-up plays to create leading, competitive national and regional telecommunications enterprises.

Grain Management, LLC ("Grain" or the "Firm") is a leading private investment firm that focuses on broadband communications infrastructure and technology companies that connect the world to the information economy. Founded in 2007, the Firm invests exclusively in the global telecommunications sector, employing a rigorous, data-based process buoyed by deep industry expertise to identify investment opportunities in key areas of telecommunications infrastructure, including fiber networks, wireless spectrum, and cell towers.

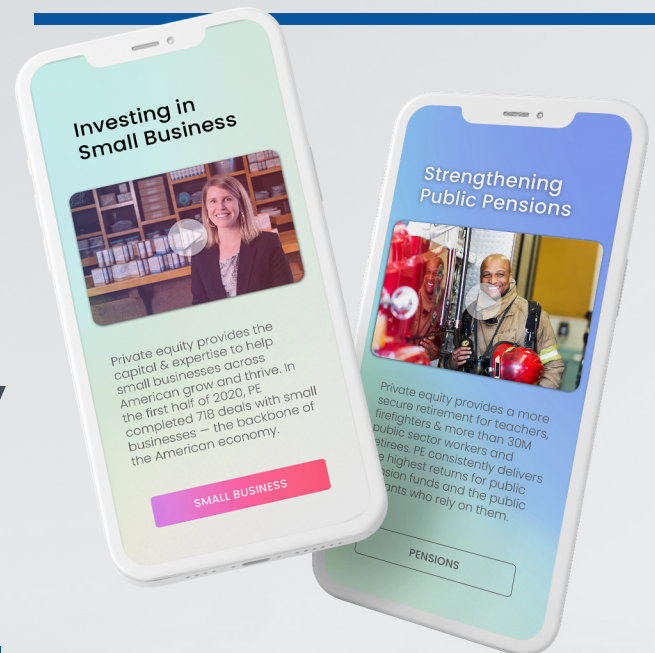
Grain has stayed laser-focused on delivering value with a differentiated approach to the sector as a digital solutions provider, driving operational excellence through a collaborative approach with its portfolio companies and a commitment to management teams. Headquartered in Washington, D.C., Grain Management is uniquely positioned at the nexus of regulation and policy-making for broadband technology with an increasingly global focus to support the worldwide demand for data and connectivity.

For more information visit www.graingp.com.

PRIVATE EQUITY INVESTING IN AMERICA

From urban to rural and everywhere in between, private equity is making a positive impact across America and investing in every community to:

- Back small businesses
- Support good-paying jobs
- Boost the American economy
- Strengthen public pensions



The American Investment Council (AIC) is an advocacy and resource organization established to develop and provide information about the private investment industry and its contributions to the long-term growth of the U.S. economy and retirement security of American workers. Member firms of the AIC consist of the country's leading private equity and growth capital firms united by their successful partnerships with limited partners and American businesses.

Let your voice be heard. Join the AIC today.

[INVESTMENTCOUNCIL.ORG](https://www.investmentcouncil.org)