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Constructing the Future: Building Resilient Portfolios With Infrastructure

The infrastructure landscape is changing—and expanding—rapidly. Driven by megatrends including Digitalization, Energy Transition, Supply Chain & Logistics and Urbanization, infrastructure investment continues to grow. Within this universe, private infrastructure stands out as a potentially vital component of investment portfolios, offering stability, inflation protection and diversification in an increasingly uncertain world. This paper examines the infrastructure growth trend and the various opportunities that may be available for institutions within the private investment sphere.

Executive Summary

- Demand for infrastructure is surging, fueled by four megatrends: Digitalization, Energy Transition, Supply Chain & Logistics, and Urbanization.
- The interplay between public and private investments has become a defining feature of the modern infrastructure landscape. Governments are increasingly leveraging public funding to attract private capital for critical infrastructure projects, creating a symbiotic relationship between the two sectors.
- Infrastructure's key attributes—essentiality, long asset life, high barriers to entry, inflation protection and stable cash flows—make it attractive for portfolio diversification and resilience, especially during economic and geopolitical volatility.
- The definition of infrastructure investments is expanding, and higher risk-return strategies (value-add, opportunistic) are growing faster than traditional core/core-plus strategies.
- We believe that co-investments and secondaries are underutilized yet powerful tools for portfolio construction, offering cost efficiency, flexibility and faster access to cash flows. The infrastructure secondary market is growing rapidly, with assets under management rising from $14 billion in 2020 to $31 billion in 2024.[1]
- Private infrastructure stands out as a vital component of investment portfolios, offering stability, inflation protection and diversification in an increasingly uncertain world. By adopting a strategic approach and building diversified portfolios, we believe institutional investors can unlock the full potential of infrastructure, positioning themselves to achieve sustainable, long-term return potential while navigating the complexities of today's global landscape.

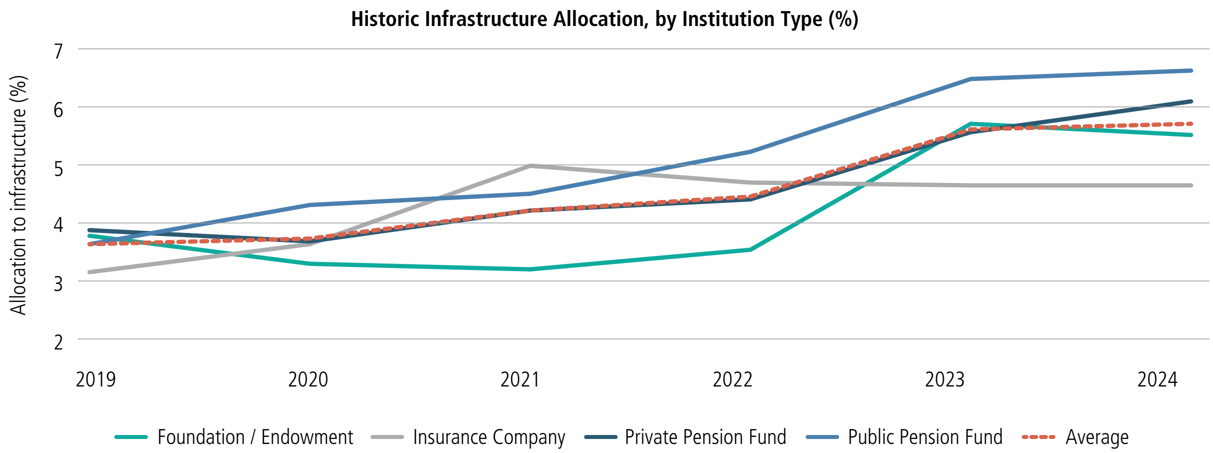
Private Capital's Growing Role in the Infrastructure Ecosystem

Over the past decade, private infrastructure assets under management (AUM) have skyrocketed, more than quadrupling to an impressive $1.5 trillion in 2024, reflecting 5% growth from the previous year and a 16% CAGR over the past decade.[2] This growth highlights the increasing prominence of infrastructure as an asset class for institutional investors, given its resilience, diversification advantages and alignment with transformative global megatrends. These results underscore the sector's growing appeal amid evolving market dynamics.

The growing demand for the asset class is most notable in institutional allocations. Limited Partners (LPs) continue to seek out infrastructure investments, with average institutional allocations rising to 5.7% in 2023, up from 3.6% in 2019.[3] According to *Infrastructure Investor*, over 94% of LPs anticipate maintaining or increasing these allocations in 2025, underscoring the confidence many investors place in infrastructure as a reliable source of stable returns, and an all-weather strategy adequately insulated from economic and political turbulence.[4]

[1] Preqin, as of December 2024.
[2] Preqin, as of December 2024. Excludes secondary and fund of funds assets under management.
[3] *Infrastructure Investor's Investor Report*, 2024.
[4] *Infrastructure Investor's LP Perspectives*, 2025.

INSTITUTIONAL ALLOCATIONS TO PRIVATE INFRASTRUCTURE ARE GROWING



Source: Infrastructure Investor Report 2024. Data as of December 31, 2024.

Demand for Infrastructure Is Soaring

The global infrastructure landscape is undergoing a fundamental transformation. Four interconnected megatrends—Digitalization, Energy Transition, Supply Chain & Logistics, and Urbanization—are shaping investment needs.

As an example, high-growth sectors like data centers have recently seen a sharp rise in investment demand, reflecting their critical role in the emerging digital economy. This surge has also fueled increased activity in adjacent sectors such as power generation and utility services, as data centers require significant power and often significant water for cooling. Similarly, increasing use of renewables requires additional transmission and often stabilizing battery or other on-demand power generation infrastructure. These examples highlight the interconnected nature of these essential assets. Combined, these interconnected megatrends position the asset class for continued growth across geographies and subsectors.

The Megatrends Bolstering Infrastructure Demand

Digitalization	Energy Transition	Supply Chain & Logistics	Urbanization
Over the next five years, consumers and businesses are expected to generate twice as much data as was produced in the entire previous decade. Data storage has been progressively increasing worldwide, with 64.2 zettabytes of recorded data in 2020. The amount of data created and consumed is estimated to reach 180 zettabytes by 2025.[5]	Global annual clean energy investments must triple to approximately $4 trillion by 2030 for net-zero goals to stay on track.[6] Keeping the world on track to achieving energy transition in line with the 1.5°C scenario will require around $150 trillion in cumulative investments between 2023 and 2050.[7]	In 2022, the U.S. announced a record level of reshoring-related manufacturing jobs, marking a 53% increase from 2021 as firms pivoted toward domestic production after pandemic woes.[8] In 2025 and beyond, this shift is expected to intensify with recent U.S. and global retaliatory tariffs.	In the U.S., the trend of Southern states netting more one-way U-Haul customers continued in 2024, with South Carolina topping the U-Haul Growth Index for the first time. Texas, North Carolina, Florida and Tennessee round out the five leading growth states, showing migration toward midsized urban centers.[9]
Key Themes: Artificial Intelligence, 5G, Internet of Things, Cloud Computing, Big Data	**Key Themes:** Renewables, Storage, LNG, Grid Resiliency, Electric Vehicles	**Key Themes:** Transportation, E-commerce, Logistics Hubs, Deglobalization	**Key Themes:** Public Transit, Tollways, Utilities

[5] Exploding Topics, "Amount of Data Created Daily," April 2025.
[6] IEA, *Net Zero by 2050*, 2021.
[7] IRENA, *World Energy Transitions Outlook 2023: 1.5°C Pathway*, June 2023.
[8] *Reshoring Initiative 2022 Data Report*.
[9] *U-Haul Growth States of 2024: South Carolina Tops List for First Time*, January 2025.

Potential Investment Benefits of Private Infrastructure

Megatrends driving strong investment demand, coupled with a comparative shortage of traditional infrastructure funding—often from government sources—have created ongoing opportunities for private capital to play a pivotal role in infrastructure development. Allocators assess these investments not only for their alignment with macroeconomic tailwinds but also for the unique attributes of the asset class that distinguish it and result in low correlations to other asset classes. For traditional infrastructure assets, these key attributes include:

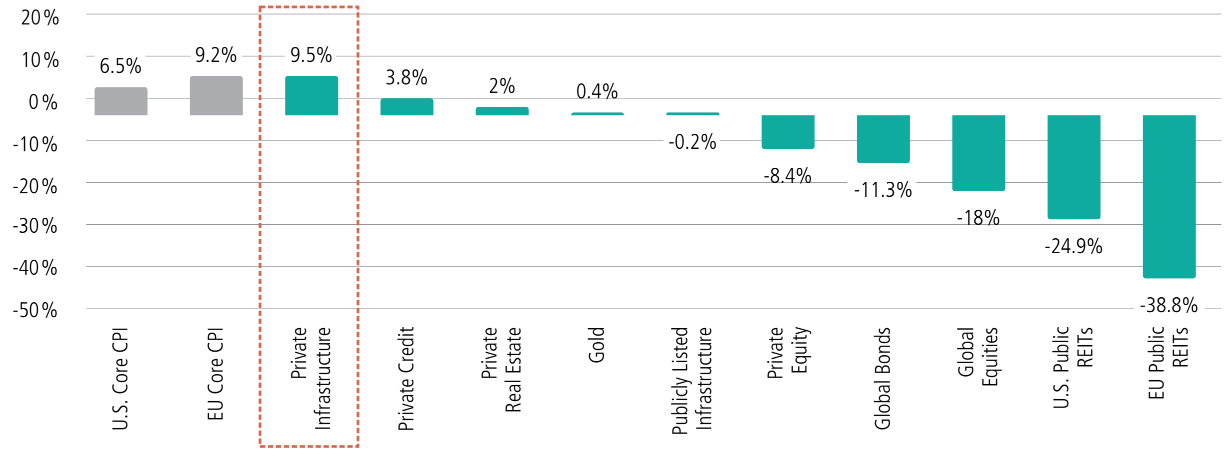
1. **Long life:** Traditional core infrastructure assets are engineered to remain operational for decades, providing long-term reliability and functionality before requiring major overhauls or replacements.
2. **High barriers to entry:** Projects are characterized by lengthy development timelines and stringent regulations for critical assets and services, resulting in significantly reduced competition within the sector.
3. **Inflation protection:** Revenues are frequently linked to inflation, either through pricing formulas established by regulatory authorities or through contracts that incorporate inflation-adjustment mechanisms.
4. **Stable cash generation:** Assets typically function under regulatory oversight or long-term contracts, providing high visibility into future cash flows. The demand for these essential services remains consistent, unaffected by changes in pricing or user income, resulting in reliable and stable income streams. This income can be distributed to investors or reinvested into capital expenditures, supporting sustained financial performance over time.

These attributes are common factors in virtually all traditional "core" and "core-plus" infrastructure investments. Where one or more are absent, as with "value-add" or "opportunistic" investments, which may be greenfield, less monopolistic, more growth-oriented, more exposed to commodity price fluctuations or located in emerging markets, investors can be compensated with meaningfully higher return potential.

In our view, private infrastructure offers compelling benefits for inclusion in investment portfolios, particularly in today's environment of geopolitical tensions, inflationary pressures and macroeconomic uncertainty. As a long-duration asset class, infrastructure provides stability through predictable, inflation-linked cash flows derived from essential services like transportation, utilities and energy. These services are often regulated or governed by long-term contracts, ensuring steady income streams even in volatile economic conditions. This reliability makes infrastructure an attractive option for investors seeking to anchor their portfolios with assets that can withstand fluctuating market dynamics.

Across the spectrum of Infrastructure assets, the performance of this segment of private markets has proven highly resilient in periods of volatility and high inflation. Comparative performance during the steepest part of the recent inflationary cycle illustrates this attribute (see display).

COMPARATIVE RETURNS THROUGH STEEPEST PART OF RECENT INFLATIONARY CYCLE (4Q 2021 – 4Q 2022)



Source: Bloomberg-Barclays, J.P. Morgan, FTSE Nareit, NCREIF, LBMA, Burgiss. Analytics as of February 28, 2025. Private Equity: Burgiss Global Equity Index, Private Infrastructure: Burgiss Global Infrastructure Index, Private Debt: Burgiss Global Debt Index, Global Bonds: Bloomberg Barclays Global Aggregate, Global Equity: MSCI ACWI (All Country World Index), U.S. Public REITs: FTSE Nareit U.S. Real Estate Index, EU Public REITs: FTSE EPRA Nareit Developed Europe, Publicly Listed Infrastructure: S&P Global Infrastructure Index, Gold: LBMA Gold Price, Private Real Estate: Burgiss Global Real Estate indexes.

Stabilizing Impact of Private Infrastructure in Portfolios

Another key advantage of private infrastructure is its low correlation to traditional asset classes such as equities and fixed income. This characteristic enhances diversification, helping to reduce overall portfolio risk while maintaining strong risk-adjusted returns. By investing in infrastructure, institutional investors gain exposure to assets that are less sensitive to broader market cycles, offering resilience during periods of uncertainty. Additionally, the essential nature of infrastructure services supports consistent demand, further strengthening the asset class's appeal as a stabilizing force in portfolios.

PRIVATE INFRASTRUCTURE HAS DELIVERED LOW CORRELATIONS TO OTHER ASSET CLASSES

Volatility and Correlation Characteristics of Various Models of Infrastructure Return

Correlation Matrix	Global Fixed Income	U.S. Equity	Global Equity	Private Real Estate	Global Private Equity	Private Timber	Private Infrastructure Equity
Global Fixed Income	1.00	0.12	0.23	0.02	0.19	-0.02	0.24
U.S. Equity	0.12	1.00	0.97	0.36	0.74	0.18	0.52
Global Equity	0.23	0.97	1.00	0.38	0.79	0.16	0.59
Private Real Estate	0.02	0.36	0.38	1.00	0.70	0.26	0.59
Global Private Equity	0.19	0.74	0.79	0.70	1.00	0.19	0.68
Private Timber	-0.02	0.18	0.16	0.26	0.19	1.00	0.17
Private Infrastructure Equity	0.24	0.52	0.59	0.59	0.68	0.17	1.00
Annualized Volatility	**6.7%**	**18.0%**	**18.8%**	**9.8%**	**12.1%**	**5.0%**	**8.9%**

Source: Bloomberg, Cambridge Associates. Correlations and volatilities are estimated from quarterly historical return series from 1Q 2000 to 1Q 2024. NB uses the Bloomberg Global Aggregate Total Return Index to represent Global Fixed Income, and uses the S&P 500 Index for U.S. Equity, and uses the S&P MSCI ACWI Index for Global Equity. The data source of Private Real Estate, Private Equity, Private Timber and private Infrastructure Equity is Cambridge Associates.

Potential Benefits of Looking Beyond Traditional Infrastructure Investments

While over two-thirds of global infrastructure assets under management remain focused on core and core-plus strategies, which emphasize lower-risk, income-generating investments, growth has been steady in higher risk-return approaches. Value-add and opportunistic strategies have experienced notable expansion, increasing from approximately $274 billion AUM in 2020 to $431 billion AUM in 2024, while core and core-plus strategies increased from $563 billion to $896 billion between 2020 and 2024.[10] This trend reflects investors' growing interest in seeking enhanced return potential through growth opportunities while maintaining the downside protection traditionally associated with infrastructure investments. Allocators are increasingly evaluating higher-risk infrastructure strategies, seeking to diversify their portfolios by targeting assets with strong growth potential, opportunities for substantial capital investment, or the ability to be de-risked and repositioned into core or core-plus strategies.

Simultaneously, the definition of infrastructure is expanding, moving beyond traditional assets like roads, bridges and power plants to include telecommunications infrastructure such as cellular towers, fiber optic networks and data centers, as well as renewable energy assets like power generation and storage, and social infrastructure including specialized health care facilities.

Investors are increasingly adopting a holistic approach to infrastructure, viewing it as a network of interconnected systems critical to the functioning of modern society. This perspective has broadened the investment universe to include not only traditional infrastructure assets but also businesses that service and support these assets. Additionally, the megatrends discussed above and others such as climate change, decarbonization, resilience and smart infrastructure are driving the development of more specialized and differentiated investment strategies. While these advancements enhance the attractiveness of the infrastructure asset class, they also introduce added complexity for institutional investors navigating this evolving landscape.

Proliferation of General Partners and Funds

The rapid growth of infrastructure as an asset class has led to a significant proliferation of General Partners (GPs) and fund offerings, reflecting the increasing demand for private capital to address global infrastructure needs. As the asset class has expanded to include a broader range of sectors and strategies, institutional investors now face the challenge of navigating a crowded and fragmented manager universe. With numerous GPs entering the market and launching funds tailored to diverse themes, the lack of standardized definitions across strategies further complicates the landscape, making it difficult to compare opportunities effectively. At the end of 2024, *Infrastructure Investor* reported 552 infrastructure funds in market targeting approximately $500 billion of capital.[11] At the end of 2020, 356 infrastructure funds were in market targeting some $207 billion of capital.[12]

Adding to these complexities is a wide variance in risk-return profiles within similar infrastructure themes. For example, investments in renewable energy or telecommunications may run the gamut from low-risk, income-generating assets to higher-risk, growth-oriented opportunities. This disparity requires investors to carefully assess their objectives and risk tolerance when selecting managers and allocating capital. Without clear benchmarks or uniform classifications, institutional investors must rely on rigorous due diligence to evaluate the quality and alignment of fund offerings with their portfolio goals.

The proliferation of GPs and funds has made informed decision-making more challenging, underscoring the importance of strategic portfolio construction. Institutional investors must not only identify managers with proven expertise and track records but also ensure that their selections complement existing portfolio exposures and align with long-term investment strategies. As the infrastructure asset class continues to evolve, the ability to effectively navigate this complex environment will be critical to unlocking its full potential while mitigating risks.

[10] Preqin, as of December 2024.
[11] *Infrastructure Investor's, Investor Report, 2024.*
[12] *Infrastructure Investor's, Investor Report, 2020.*

Untapped Potential: Co-Investments and Secondaries

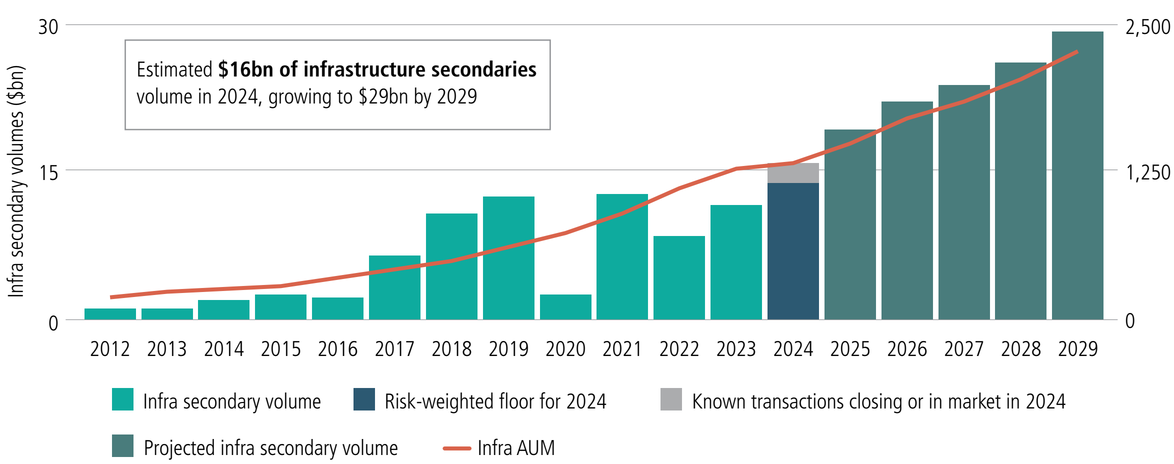
In our view, strategic portfolio construction in private infrastructure requires a thoughtful approach that incorporates a variety of investment strategies that seek to achieve diversification, resilience and optimal returns. By leveraging the strengths of primaries, co-investments and secondaries, investors can build portfolios that align with their long-term objectives while capitalizing on the unique opportunities within the asset class.

Primaries form the foundation of most private infrastructure portfolios, offering diversification across industries and access to market-leading expertise. By complementing investments with large-cap managers with broad sector experience, investors are likely to achieve stability and consistency in their portfolios. Additionally, incorporating mid-market managers that focus on select sub-sectors adds depth and specialization, allowing for exposure to niche opportunities that may offer enhanced returns. This balanced approach promotes portfolios that are both diversified and positioned to capture growth across various infrastructure categories.

Co-investments provide investors with a valuable opportunity to actively shape their portfolios while optimizing cost efficiency. By participating in high-quality, selectively curated deals, investors can gain direct exposure to specific asset types or sectors that align closely with their strategic goals. Co-investments offer flexibility in portfolio pacing, allowing capital deployment to be adjusted based on market conditions while also enabling investors to selectively increase exposure to preferred assets or sectors. This approach helps balance exposure across general partners and geographic regions, creating a more diversified and tailored portfolio. Additionally, co-investments often feature reduced fee structures, enhancing overall cost efficiency and making them a powerful tool for strategic portfolio construction.

Secondaries represent a compelling avenue for infrastructure investment, offering capital-efficient exposure to established portfolios, often acquired at a discount. Traditional LP secondaries allow investors to mitigate risk by providing visibility into asset performance and portfolio composition before committing capital, while GP-led transactions create opportunities to invest in successful assets with proven track records and de-risked growth or operational plans. These transactions leverage the sponsor's deep familiarity with the assets, its management teams and proven growth strategy, enabling participation in stable yet high-potential opportunities. Additionally, secondaries help mitigate the J-curve effect by delivering early cash flows and allow investors to backfill missing vintage years, ensuring balanced allocations across time periods. The market for infrastructure secondaries has evolved significantly, with notable growth in both GP-led and traditional LP transactions, reflecting increased liquidity and optionality in the infrastructure space. As such, infrastructure secondaries have become an increasingly valuable tool for enhancing portfolio strategy and efficiency.

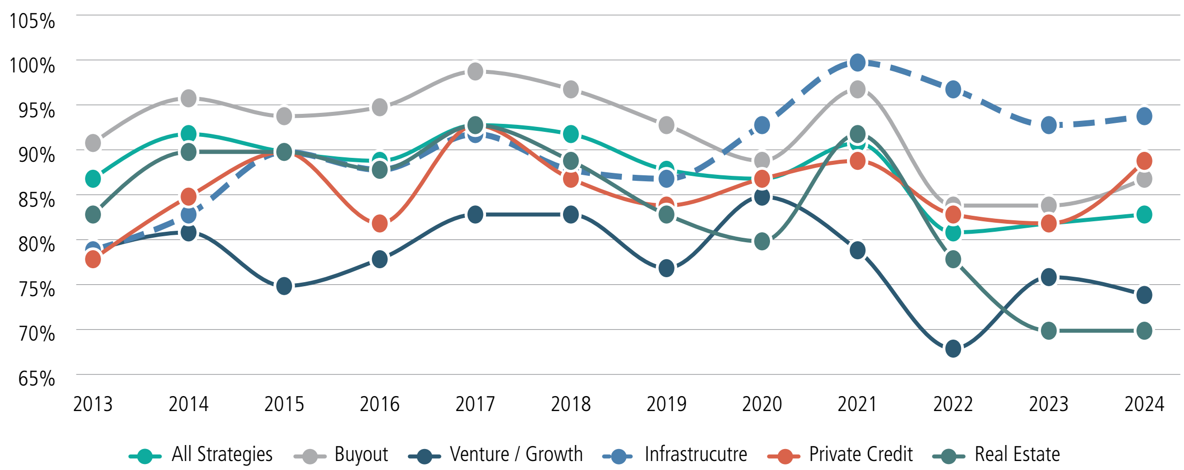
EVOLUTION OF INFRASTRUCTURE SECONDARY MARKET



Source: Campbell Lutyens, *Infrastructure Market Report, 4Q2024.*

The infrastructure secondary market has experienced significant growth in recent years, mirroring trends seen in co-investments as investors increasingly recognize its potential. Assets under management for secondary vehicles have risen sharply, reaching $31 billion in 2024, up from $14 billion in 2020.[13] Transaction volumes have grown at a 17% compound annual growth rate since 2017 (through 2024), outperforming the broader infrastructure market's growth of 13% CAGR and reflecting the rapid expansion of the asset class. Infrastructure secondaries now represent the second-largest secondary asset class after buyouts and are expected to continue growing, with deal volumes projected to increase from $16 billion in 2024 to $29 billion by 2029.[14] Historically, GP-led transactions have dominated the market, driven by the rise of continuation vehicles for large assets. However, as the asset class matures, a steady flow of LP-led transactions is emerging. These factors underscore the market's resilience and ongoing appeal to investors.

HISTORICAL SECONDARY PRICING (% OF NAV)



Source: *Greenhill Global Secondary Market Review, FY 2024.*

Despite their increasing availability, co-investments and secondaries remain underutilized tools in institutional infrastructure portfolios even though they offer unique advantages that can enhance the efficiency and flexibility of investment portfolios. Greater inclusion of both secondaries and co-investments in institutional infrastructure portfolios has the potential to significantly enhance portfolio efficiency and flexibility. By leveraging these tools effectively, investors can achieve more robust and resilient portfolios, better equipped to navigate the complexities of the modern investment landscape.

Conclusion

The infrastructure investment landscape is undergoing profound evolution, marked by increasing complexity and fragmentation as the asset class continues to expand and diversify. In our view, institutional investors should navigate this dynamic environment with a strategic and diversified approach, balancing growth opportunities with resilience to mitigate risks. In our view, successfully building future-ready portfolios requires partnering with experienced professionals who possess the expertise to identify high-quality opportunities, adapt to shifting market dynamics and optimize portfolios for long-term value creation. In an era defined by uncertainty and rapid change, infrastructure investments stand as a critical pillar for sustainable portfolio growth.

[13] Preqin, as of December 2024.
[14] Campbell Lutyens, *Infrastructure market report Q4 2024.*

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