

## Infrastructure Primer

WHITEPAPER

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In this paper, we examine the private infrastructure asset class as it pertains to institutional portfolios. We briefly describe the asset class, its sub-categories and strategies, its risk and return profile, and implementation considerations. We focus on private markets infrastructure in this paper.

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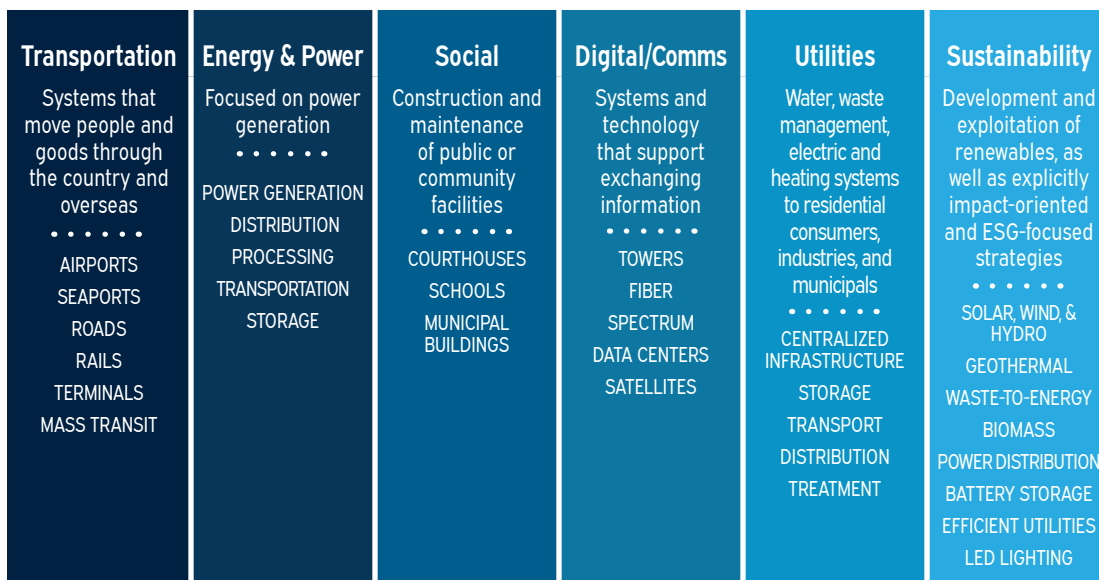
### What is infrastructure?

As an investment asset class, infrastructure includes long-lived tangible assets that derive value from their intrinsic physical characteristics. Infrastructure is the foundation for the production and delivery of goods and services critical to the global economy.

Infrastructure assets often have some combination of the following characteristics: long useful lives, high barriers to entry, monopolistic market positioning, and generally stable usage. Infrastructure investments also usually enjoy inelastic demand, relatively stable cash flows, and low long-term exposure to commodity prices. These attributes are usually attached to assets that have an “essentiality” component, such as those associated with transportation, energy and other critical utilities, government operations, and mass communication networks.

### Sectors

The private infrastructure asset class can be categorized both by the sectors it targets as well as by its risk-return profiles. Figure 1 below depicts the various primary sectors that infrastructure invests in, as well as the key sub-sectors within each.



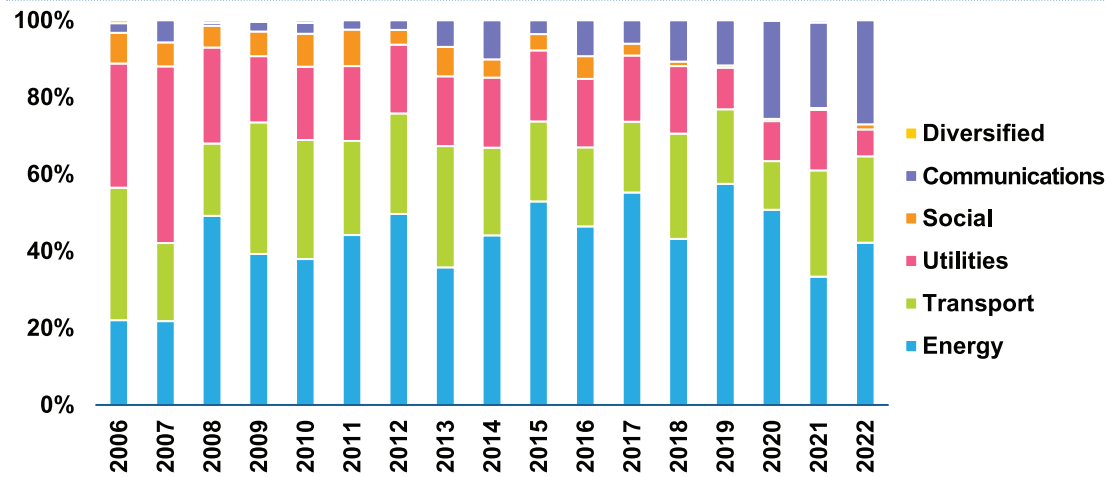
**FIGURE 1**  
**Breakdown of Infrastructure Sectors and Sub-Sectors**

Source: Meketa Investment Group, 2023.

Sustainability has more recently been considered its own sector by some investors and has shown an increase in investor demand. While the “renewables” sector has been around since the infrastructure asset class became institutional, sustainability tends to be broader, encompassing renewable energy as well as other sustainable sub-sectors.

Infrastructure managers can be sector specialists targeting one sector or can aim to diversify across multiple sectors (typically two to four). Figure 2 below shows a sector breakdown by deal value. The energy and transportation sectors have comprised more than half of total deal value since 2006. This is followed by utilities, though communications has increased substantially in recent years.<sup>1</sup>

<sup>1</sup> Source: Preqin, as of November 2023.



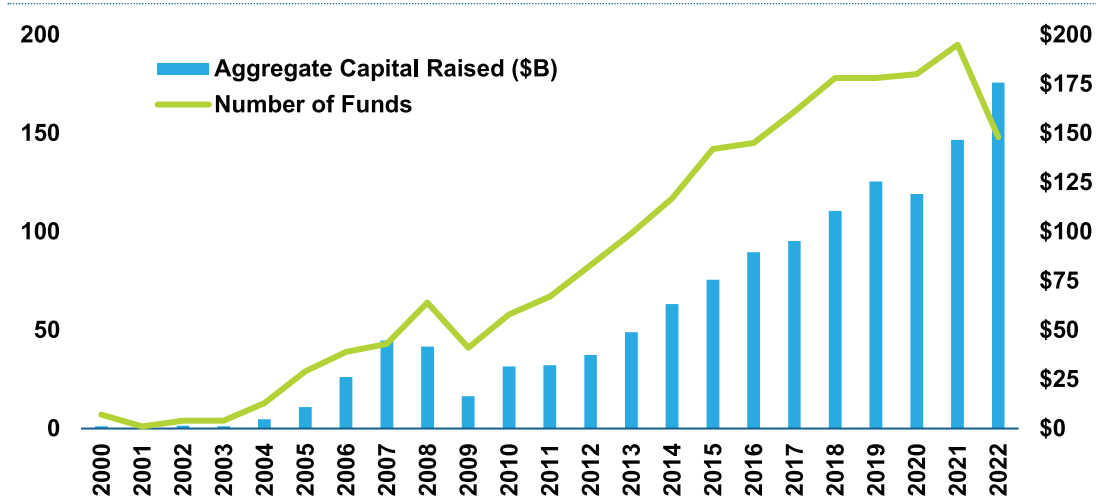
**FIGURE 2**  
Global Infrastructure Deals by Sector (by aggregate deal value)

Source: Preqin, as of November 2023. Social includes the Defense, Education Facilities, Government Buildings, and Healthcare/Medical Facilities sub-sectors. Transport includes the Transportation and Logistics subsectors. Utilities includes the Utilities and Waste Management subsectors.

### Investable universe

The investable private infrastructure universe first became a noteworthy part of the private market landscape around 2006, and it has grown more robust ever since. Infrastructure funds have raised approximately \$1.3 trillion from 2000 through 2022 (see Figure 3). More recently, aggregate capital raised per year has grown to a record \$176 billion in 2022.<sup>2</sup> Since 2009, infrastructure fundraising has grown every year except during the COVID-19 pandemic in 2020. The number of funds in the infrastructure market in any given year has also grown considerably, reaching almost 200 in 2021.

<sup>2</sup> Source: Preqin, as of September 2023.

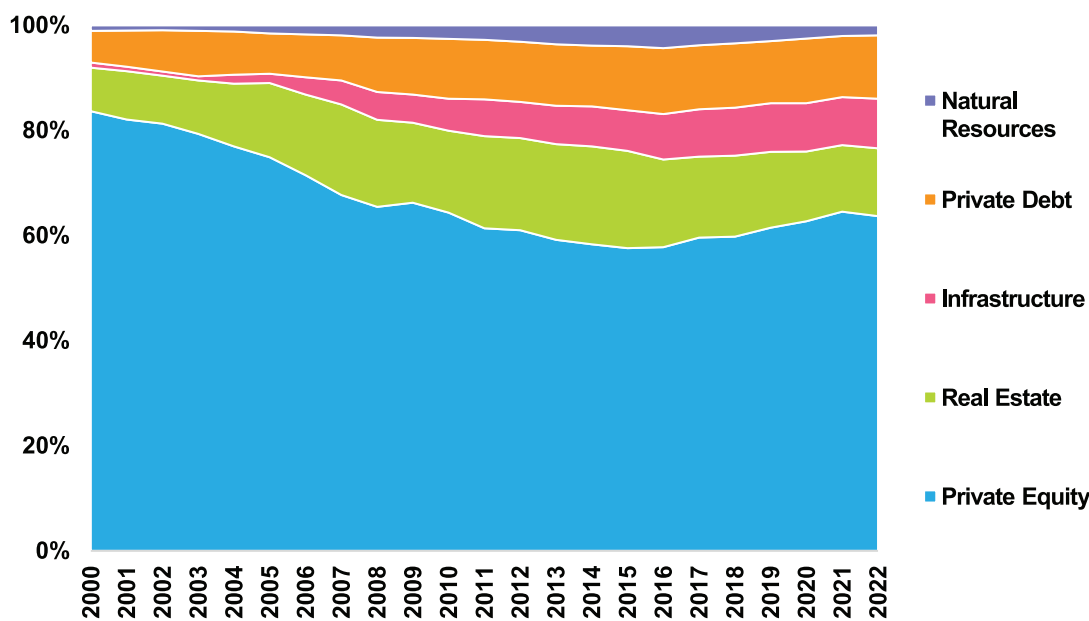


**FIGURE 3**  
Global Private Infrastructure Aggregate Capital Raised and Number of Funds

Source: Preqin, as of September 2023.

Even with its high growth over the past decade, infrastructure has averaged roughly 7% of the total annual assets under management (“AUM”) across all private asset classes since 2006 (see Figure 4). This average has not changed significantly over the last decade, holding fairly steady around 8.6%.<sup>3</sup>

<sup>3</sup> Source: Preqin, as of November 2023. Global private markets include Infrastructure, Private Equity, Real Estate, Natural Resources, and Private Debt.



**FIGURE 4**  
Global Assets Under Management by Private Markets Asset Class

Source: Preqin, as of November 2023. Natural Resources includes Natural Resources and Timberland fund types only to avoid double counting. To avoid double counting of available capital and unrealized value, fund of funds and secondaries are excluded.

## Infrastructure strategies and geography

In the section above, we detailed private infrastructure’s numerous sectors and the sub-sectors within each. In this section, we describe the primary strategies infrastructure targets, as categorized by their risk-return profiles. These various infrastructure strategies often reflect different economic exposures and potential opportunities. We also provide a geographical breakdown of the asset class.

### Strategies

Infrastructure strategies, differentiated by their risk and return profiles, are often the first dimension established for diversification within an infrastructure program. Both equity and debt strategies are available in infrastructure. Equity strategies may be broadly characterized as core, core plus, value add, and opportunistic, on a continuum from lower risk and return to higher risk and return. The strategies are not mutually exclusive. Additionally, the risk/return profile of any individual asset may purposefully change over an owner’s hold period, as managers may enter an investment at a relatively higher risk-return profile, work to de-risk or otherwise improve the asset, and exit by selling it to investors with a relatively lower risk-return target.

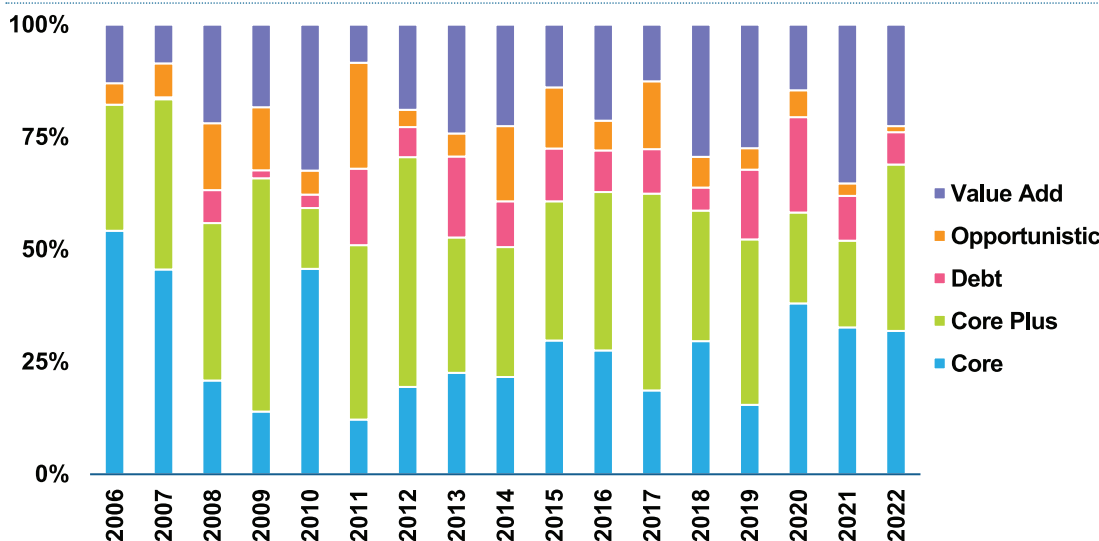
	Description	Typical Investments	Return Drivers	
Return Potential / Riskiness ↑	<b>Opportunistic</b>	Often involves new construction or development of an asset, which has more risk than buying an existing operational asset, but also offers the greatest potential return. These investments involve an elevated level of uncertainty, which may be related to revenue stability, future demand or usage, or significant exposure to commodity prices. This may also include projects in developing countries.	Target deals may include brownfield assets that are more complicated or involve more capex than value add strategies, and/or "greenfield" assets that do not currently exist.	In developed markets, returns are mostly driven by capital appreciation. In other geographies, there could be more of a yield component, for example, if executing an otherwise core or value add strategy.
	<b>Value Add</b>	Assets that have many of the same qualities as core assets but offer the opportunity for additional value creation through further development, new or extended contracts, or increased capacity.	Typically, "brownfield" situations involving an existing, operating asset needing improvements, repairs, or expansion. May also involve renegotiating and extending contracts or repurposing existing assets.	Returns are derived from a combination of yield and capital appreciation.
	<b>Core Plus</b>	Exists between and often overlaps with core and value add. It could also reflect a "build to core" strategy, where the assets would have a higher risk-return profile during the development, construction, and early operations stage, but will ultimately qualify as a core asset for a long-term hold period.	Involves facility expansions without a complete retrofit or rehabilitation.	Portions of total return from yield and appreciation between core and value add. Also, may have lower yields than core early in the term.
	<b>Core</b>	Assets that are essential to the economy and have a high certainty of revenue through long-term contracts, significant cash yield, and a strong link to inflation, often through a pass-through mechanism.	"Secondary stage" assets that are fully operational and require no investment for development.	Returns are primarily attributable to current yield over a long-term, even perpetual hold.

**FIGURE 5**  
Infrastructure Strategy Descriptions & Risk-Return Profiles

Source: Meketa Investment Group, 2023.

Many institutional investors tilt their infrastructure portfolios toward lower risk, cash yielding strategies. Since 2006, core and core plus have represented 28% and 33% of global annual capital raised, respectively. Value add comprised the next largest segment at 20%, followed by debt and opportunistic at 9% each of annual capital raised.<sup>4</sup>

<sup>4</sup> Source: Preqin, as of September 2023. Period is 2006 to 2022.



**FIGURE 6**  
Aggregate Capital Raised Globally by Infrastructure Strategy

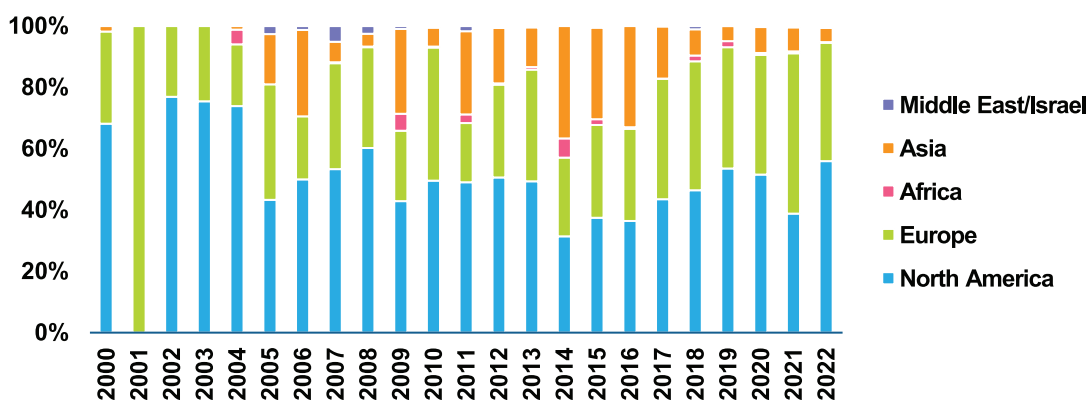
Source: Preqin, as of September 2023.

Investors may include infrastructure debt in either an infrastructure or private debt allocation. Infrastructure debt strategies typically offer higher yields than traditional public credit. Infrastructure debt may also be used to diversify a predominantly infrastructure equity portfolio, via lower volatility and better downside protection than equity strategies, and with stable returns like those of core strategies. Infrastructure debt often comes with contracted revenues and strong counterparties, and may offer upside potential through warrants, options, convertible debt, and other instruments. A disadvantage of infrastructure debt is that it does not offer the same ownership opportunities and control/governance rights as equity stakes can.

## Geography

North America-focused funds dominate the infrastructure universe, averaging half of global aggregate capital raised since 2000. Europe has the second largest infrastructure market, at roughly one-third of global aggregate capital raised, followed by Asia at 13% of the market since 2000.<sup>5</sup> However, in the last five years or so, Asia's market share has declined, as measured by aggregate capital raised.

<sup>5</sup> Source: Preqin, as of September 2023.



**FIGURE 7**  
Global Aggregate Capital Raised in Infrastructure by Region

Source: Preqin, as of September 2023.

Infrastructure investments outside of the US can be segmented into two major geographies, developed markets and developing markets. Developed countries tend to offer similar categories of risk and reward attributes as those in the US. This is largely because these regions possess similar political, regulatory, and legal frameworks as the US. Developing markets include both emerging and frontier markets. These investments are generally characterized by economies with higher economic growth, but with less secure and less predictable political, legal, economic, and financing frameworks. Comfort with these risks can be more difficult to achieve and tends to require a higher level of experience and insight by managers. In any investment not denominated in US dollars, currency risk is also a consideration, and managers' hedging policies vary.

## Historical performance

Performance data for private infrastructure is less robust than that for private equity and real estate. This is because fewer funds exist and the asset class did not gain significant traction in the US until the early-to-mid 2000's.<sup>6</sup> In particular, there is no benchmark of core funds that is equivalent to those that are available for core

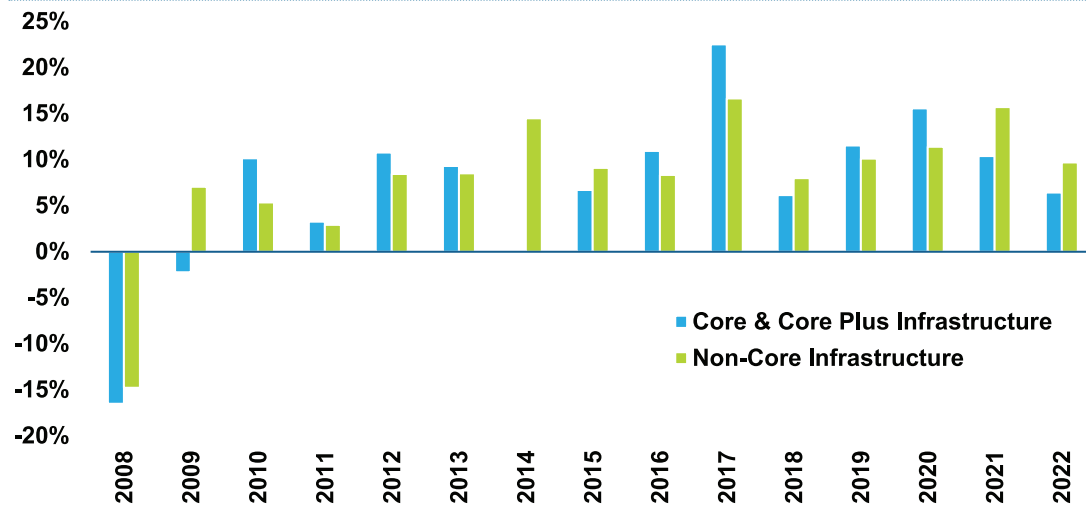
<sup>6</sup> Unless otherwise noted, 2008 is the start date for infrastructure figures and charts as it is the earliest year that has quarterly fund count of 8 or higher for each infrastructure strategy.

US real estate. Hence, throughout this paper, Cambridge Associates' Infrastructure composites are used to represent private infrastructure returns. Due to the small set of available data, the value add and opportunistic strategies are grouped together into one "Non-core" category.<sup>7</sup>

<sup>7</sup> Both value add and opportunistic represent 50% of the non-core composite. This 50/50 split was chosen based on historical average fund counts.

Figure 8 below shows the annual returns of private infrastructure's primary core/core plus and non-core strategies. The annualized returns of these two composites have been in line with expectations. Since 2008, the core/core plus composite has produced a lower annualized return of 6.7%, while non-core has produced a higher annualized return of 7.8%.<sup>8</sup>

<sup>8</sup> Quarterly returns sourced from Cambridge Associates via IHS Markit as of July 2023. Indices: Cambridge Core & Core Plus Infrastructure Composite, Cambridge Opportunistic Infrastructure Composite, Cambridge Value Added Infrastructure Composite. Period is Q1 2008 to Q1 2023.



**FIGURE 8**  
**Annual Returns by Infrastructure Strategy**

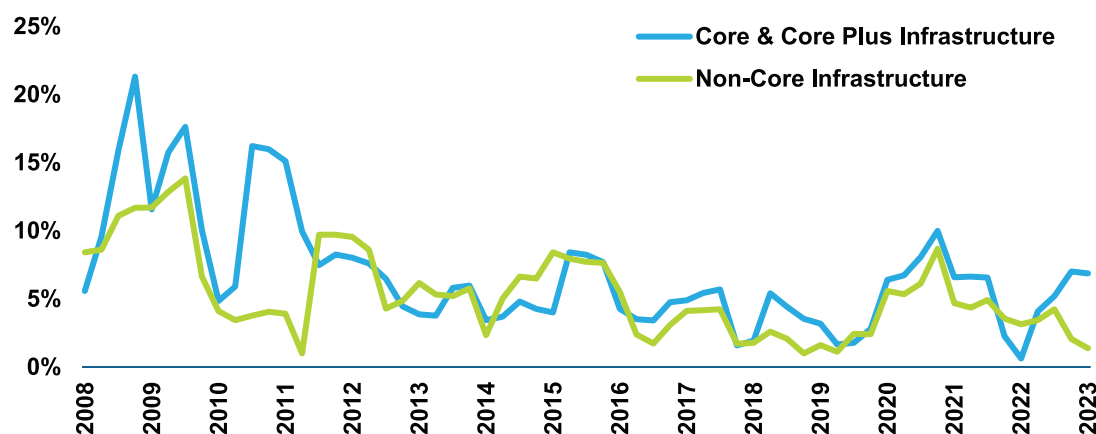
Quarterly returns sourced from Cambridge Associates via IHS Markit as of July 2023. Indices: Cambridge Core & Core Plus Infrastructure Composite, Cambridge Opportunistic Infrastructure Composite, Cambridge Value Added Infrastructure Composite.

### Volatility

The historical observed volatility of the core/core plus and non-core categories has been counter to its targeted risk-return profiles. Despite having the lowest annualized return and being considered the most stable, core/core plus exhibited the highest annualized volatility of the infrastructure strategies at 8.8% since 2008. Over the same period, non-core had an annualized volatility of 6.3%.<sup>9</sup> It is also worth noting that the nature of private infrastructure returns, like the rest of private markets, can artificially dampen volatility.<sup>10</sup>

<sup>9</sup> Quarterly returns sourced from Cambridge Associates via IHS Markit as of July 2023. Indices: Cambridge Core & Core Plus Infrastructure Composite, Cambridge Opportunistic Infrastructure Composite, Cambridge Value Added Infrastructure Composite. Period is Q1 2008 to Q1 2023.

<sup>10</sup> In general, private markets provide less price discovery and valuation transparency than public markets.



**FIGURE 9**  
**Annualized Rolling 1-Year Volatility by Strategy**

Quarterly returns sourced from Cambridge Associates via IHS Markit as of July 2023. Indices: Cambridge Core & Core Plus Infrastructure Composite, Cambridge Opportunistic Infrastructure Composite, Cambridge Value Added Infrastructure Composite.

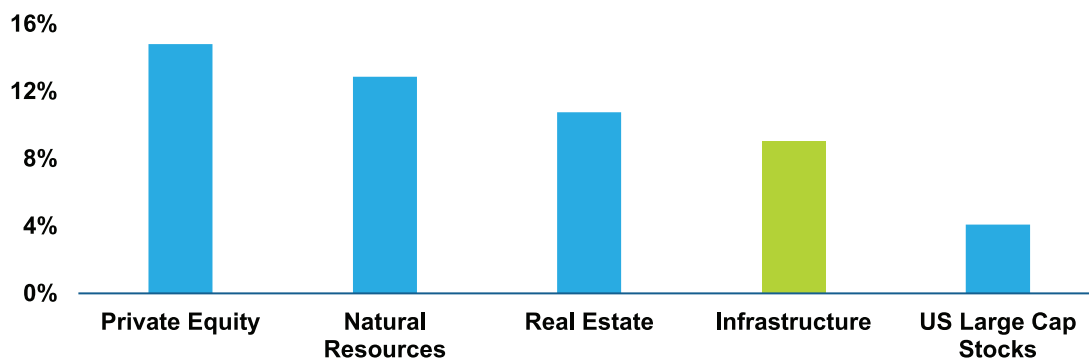
While it may seem counterintuitive that core and core plus infrastructure has exhibited higher volatility than the “riskier” non-core strategies of value add and opportunistic, this can probably be explained by the respective valuation methodologies. Core and core plus infrastructure typically invest in fully operational assets with minimal or no development needs, and these assets are typically valued on a quarterly basis based on operational metrics and industry comps. Value add and opportunistic infrastructure invest in “brownfield” and “greenfield”<sup>11</sup> assets that can require some or extensive development and may be held at investment cost until a project has been de-risked (e.g., it has reached development milestones or become operational) or sold. Therefore, while value add and opportunistic assets may entail more risk from the project’s start to its end, core and core plus projects may exhibit higher volatility of prices because of the difference in valuation methodology.

<sup>11</sup> “Brownfield” assets are existing, operating assets needing improvements, repairs, or expansion. “Greenfield” assets do not currently exist and need to be built from scratch.

## Manager alpha

Manager and fund selection in private infrastructure, like all private markets, is essential to achieving top quartile returns. Interquartile spreads can be interpreted as how much potential value lies in selecting superior funds or managers within each asset class. For infrastructure funds with vintage years 2011 to 2020, the average quartile spread was 9.0%. Compared to other private markets, infrastructure has a smaller interquartile spread than natural resources (12.9%), private equity (14.8%), and non-core real estate (10.8%), though it is still significantly larger than that for public US large cap equities (4.1%).<sup>12</sup> The inclusion of core funds in the infrastructure composite may partly explain why the spread is lower than that for the other private market composites.

<sup>12</sup> Source: Data sourced from Morningstar and Cambridge Associates via IHS Markit. Private asset funds raised Vintage Year 2011 to 2020. US equity data for the trailing 10 years as of December 31, 2020. Cambridge data sourced July 2023, Morningstar data sourced October 2023. Indices: Cambridge Infrastructure Composite, Cambridge Natural Resources Composite, Cambridge Private Equity Composite, Cambridge Real Estate Composite, Morningstar US Large Cap Equity Universe.



**FIGURE 10**  
Trailing 10-Year Interquartile Spread

Source: Data sourced from Morningstar and Cambridge Associates via IHS Markit. Private asset funds raised Vintage Year 2011 to 2020. US equity data for the trailing 10 years as of December 31, 2022. Cambridge data sourced July 2023, Morningstar data sourced October 2023. Indices: Cambridge Infrastructure Composite, Cambridge Natural Resources Composite, Cambridge Private Equity Composite, Cambridge Real Estate Composite, Morningstar US Large Cap Equity Universe. Average fund count is 21 for natural resources, 10 for infrastructure, 108 for private equity, 63 for real estate, and 320 for US equity. Natural resources does not have data for the 2020 vintage year and Infrastructure does not have data for the 2011 vintage year. For more information on US equity’s alpha calculation, see [Meketa’s Manager Alpha White Paper](#).

## Why invest in infrastructure?

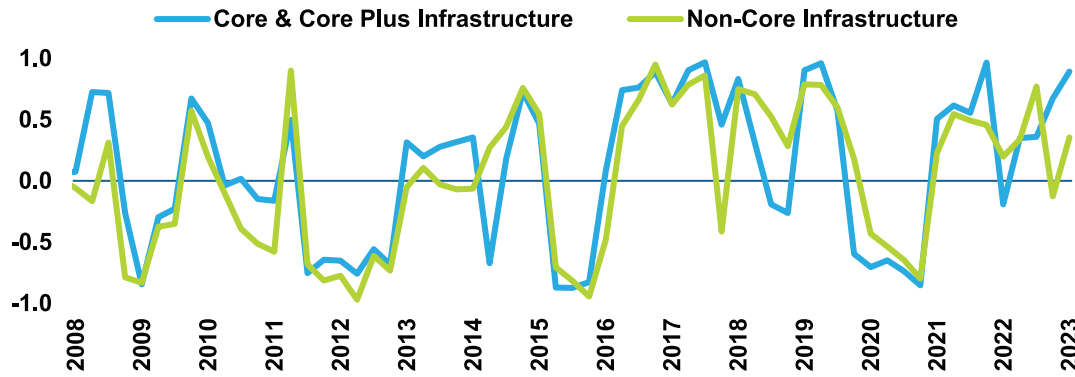
The infrastructure asset class may be appealing to investors for a number of reasons, primarily diversification benefits and inflation hedging potential. Another appealing aspect of infrastructure is the potential for income generation, depending on the strategy employed. The core and core plus strategies tend to offer meaningful income potential, whereas income is less targeted in value add and opportunistic strategies.

### Diversification from major asset classes

Infrastructure’s correlation to both US bonds and equities has varied considerably since 2008. On average, both core/core plus and non-core private infrastructure

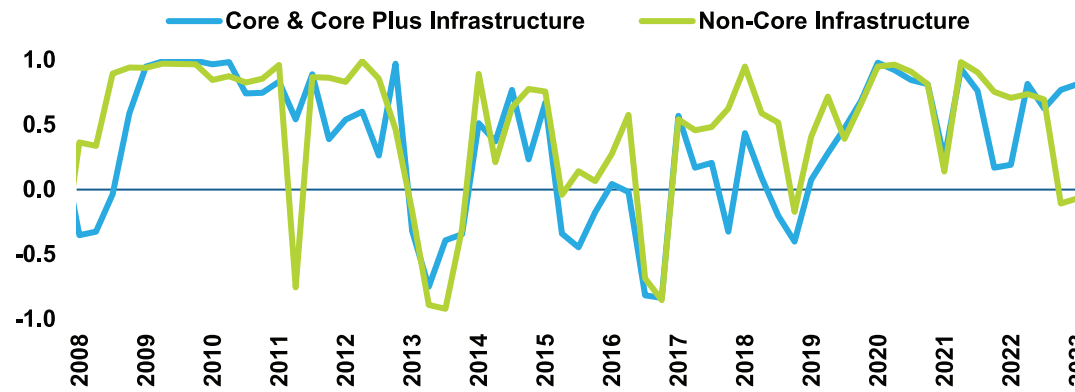
have exhibited a correlation near zero to US bonds since 2008 (see Figures 11 and 12 below). The extreme variability of the rolling 1-year correlation implies that there is no significant correlation between these asset classes. US equity also shows substantial variability in its correlations with core/core plus and non-core infrastructure. However, the average correlation is positive, at 0.55 and 0.63, respectively.<sup>13</sup> This implies they are somewhat correlated to equities, which seems intuitive as, in the long run, returns for both sets of assets are likely to be driven by economic growth.

<sup>13</sup> Quarterly returns sourced from Bloomberg and Cambridge Associates via IHS Markit as of July 2023. Indices: Cambridge Core & Core Plus Infrastructure Composite, Cambridge Opportunistic Infrastructure Composite, Cambridge Value Added Infrastructure Composite, Russell 3000 TR. Period is Q1 2008 to Q1 2023.



**FIGURE 11**  
Rolling 1-Year Correlation to US Bonds

Quarterly returns sourced from Bloomberg and Cambridge Associates via IHS Markit as of July 2023. Indices: Cambridge Core & Core Plus Infrastructure Composite, Cambridge Opportunistic Infrastructure Composite, Cambridge Value Added Infrastructure Composite, Bloomberg US Aggregate Bond Index.

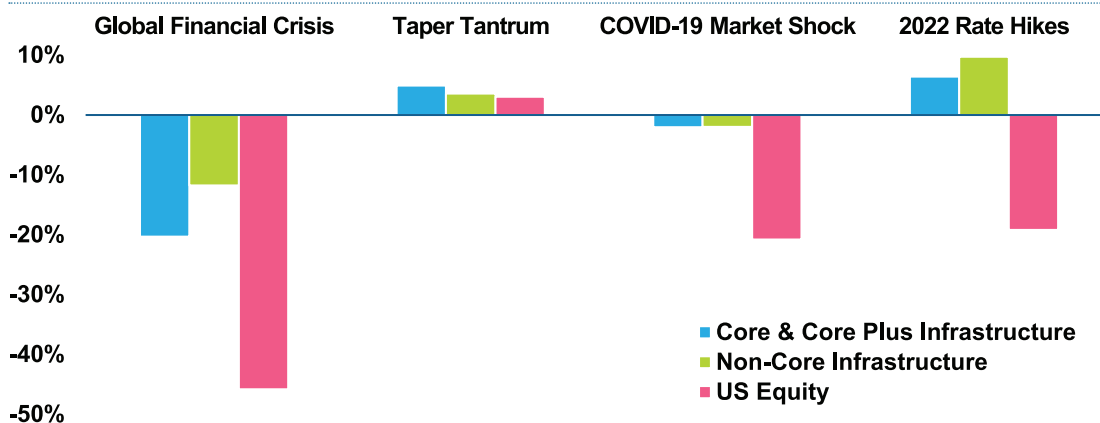


**FIGURE 12**  
Rolling 1-Year Correlation to US Equity

Quarterly returns sourced from Bloomberg and Cambridge Associates via IHS Markit as of July 2023. Indices: Cambridge Core & Core Plus Infrastructure Composite, Cambridge Opportunistic Infrastructure Composite, Cambridge Value Added Infrastructure Composite, Russell 3000 TR.

### Diversification during market downturns

Private infrastructure may help to provide investors downside protection during market downturns. As shown below in Figure 13, core/core plus and non-core infrastructure strategies have fared better than equities during the major market downturns over the last 15 or so years.



**FIGURE 13**  
Returns During Historical Market Downturns

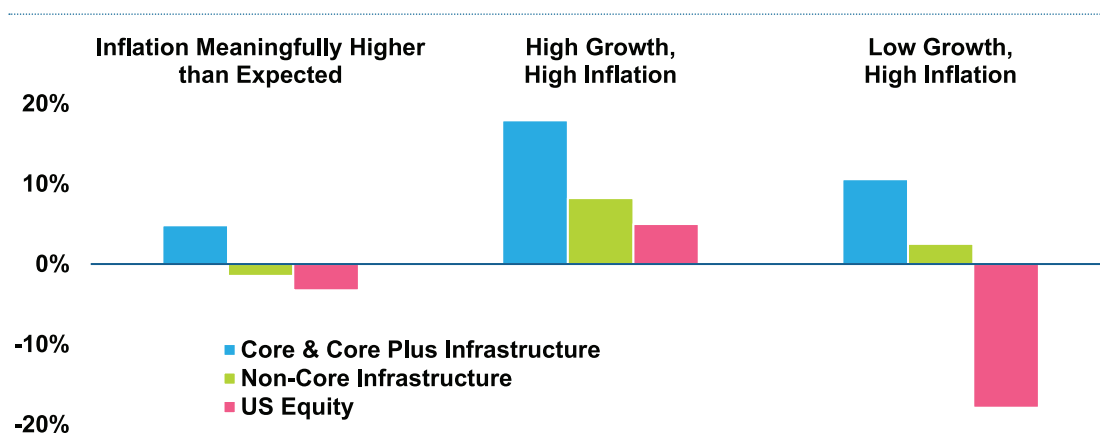
Source: Meketa's Asset Allocation Tool. Returns are cumulative for the time period over which the scenario occurred. Dates for the four events in order are: Oct 2007 - Mar 2009, May - Aug 2013, Feb 2020 - Mar 2020, Jan - Dec 2022.



## Inflation hedge

A commonly cited purpose of private infrastructure allocations is inflation protection. Many infrastructure assets include physical property that is expected to maintain or increase in value during periods of inflation. Additionally, many infrastructure investments' revenue streams have explicit inflation links under contract or concession schemes.

Infrastructure's inflation protection benefit is evident in Figure 14 below. Both core/core plus and non-core private infrastructure outperformed US equities in the inflationary scenarios, even generating positive returns. These inflationary scenarios are for the period Q2 2003 to Q4 2022, due to lack of data for earlier quarters. While inflation was low for the majority of this period, the spike in inflation near the end of the period provided perhaps the first true test of infrastructure (and many other assets) as an inflation hedge. The analysis does not suggest that infrastructure will always generate positive returns during future inflationary times. It implies that core/core plus infrastructure is more responsive to inflation than non-core infrastructure, as would be expected since core/core plus tends to have a higher percentage of contracted and otherwise inflation-linked revenues.



**FIGURE 14**  
**Inflationary Scenarios**

The inflationary scenarios analyzed were over the period 4/1/2003 to 12/31/2022 as this was the earliest data available for core/core plus private infrastructure and gave the largest time period to analyze inflationary periods over. Note that fund count from 4/1/2003 to 10/1/2007 is low, with less than 8 funds per strategy.

Source: Reflects average, annualized asset class returns. These figures are from Meketa's scenario analysis based on data from Cambridge Associates via IHS Markit, Bloomberg, and FRED from 4/1/2003 to 12/31/2022. See the appendix for more details on and descriptions of the inflationary periods included in Meketa's scenario analysis.

## Implementation considerations

There are several implementation considerations that investors should be aware of when allocating to private infrastructure, including leverage, fund structure, investment vehicles, the J-curve, and fees.

### Leverage

For infrastructure, the amount of debt managers place on investments is typically directly related to the certainty and security of the revenue streams. As such, core strategies will usually have the highest leverage (e.g., 40% to 50% at the fund level, and up to 80% or 90% for individual investments with solid cash flows). At the opposite end of the risk spectrum, opportunistic strategies will typically use little to no long-term debt, but may, for example, use construction loans that are drawn on, as needed, but not payable until completion. Value add strategies sit in between, typically having little to no leverage at entry, and using any loans for

growth plans, facility expansions, and business optimization projects. As value add investments are de-risked and more cash is available for debt service, managers may increase leverage commensurately. Infrastructure's leverage profile across its risk-return spectrum differs from that of real estate, with which investors may be more familiar, where lower risk-return real estate assets have lower levels of leverage.

### **Fund structure and investment vehicles**

Most of the current universe of infrastructure funds are structured similarly to other types of private market partnerships (i.e., with a General Partner who is responsible for investing and managing the fund and multiple limited partners who provide the capital to be invested). They are closed-end private funds, generally with terms between 10 and 15 years, with the potential for several one-year extensions. They are structured with an investment period of three to five years and will usually invest in five to 15 assets or portfolio companies. Some funds have even longer terms of up to 20 or 25 years and longer investment periods where the General Partner believes the strategy requires more time to execute and/or if investors want longer hold periods in keeping with the underlying asset lives.

The infrastructure fund universe includes open-end vehicles with no specified term end that allows the manager indefinite hold periods and eliminates the imperative to exit investments, similar to the real estate asset class. Most open-end infrastructure funds focus on core and core plus strategies, investing in assets that generate most of their return from cash yield. However, some open-end core funds do have a small allocation to development projects that reflect build-to-core strategies and other types of value add investments.

Separately managed accounts may be a potentially appealing investment vehicle for larger investors who wish to have a more customizable strategy, often with lower fees. Co-investments or direct joint ventures can provide selective exposure to individual opportunities, typically with low or even no fees, but can increase concentration risks if not sized appropriately relative to an investor's overall infrastructure portfolio. These alternatives to commingled funds are primarily accessible to larger investors with sufficient in-house or outside resources and specialization to support the extra due diligence and legal analysis these vehicles can involve. Still, more managers are offering commingled co-investment vehicles that smaller investors can more readily access.

### **J-curve**

A characteristic that many infrastructure funds share with private equity partnerships is the J-curve. The J-curve is characterized by small negative returns early in an investment vehicle's life that should turn positive with successful investments, thus making the graph of returns J-shaped. The J-curve occurs in situations where management fees, and perhaps other expenses, are funded early in an investment's hold period and not offset by revenues, profits, and/or capital appreciation until later in the fund's life. This curve can be mitigated by strategies that generate income streams from infrastructure assets upon or shortly after their acquisition. Hence, the J-curve is generally less pronounced for infrastructure than for private equity

strategies. Additionally, investors in open-end funds with existing investments will typically face no J-curve, and investors in closed-end funds with seeded portfolios may face a less steep J-curve relative to a blind pool offering.

### **Vintage year diversification**

Vintage year diversification is just as important for infrastructure portfolios as for other asset classes. Different vintage years may experience varying economic conditions, market cycles, or performance trends. There is the potential for poor vintage year timing when structuring an infrastructure program, just as in other areas of private markets. Missing out on a particularly good year, or overcommitting to a particularly bad one, will harm performance.

By diversifying across vintage years, investors can reduce the impact of poor performance in a particular year or economic environment. This helps to mitigate risk and minimize the potential negative effects of a single vintage year's underperformance. Therefore, vintage year diversification is important for a well-rounded infrastructure allocation. Using pacing plans, following them, and regularly updating them, is considered a "best practice" for maintaining vintage year diversification.

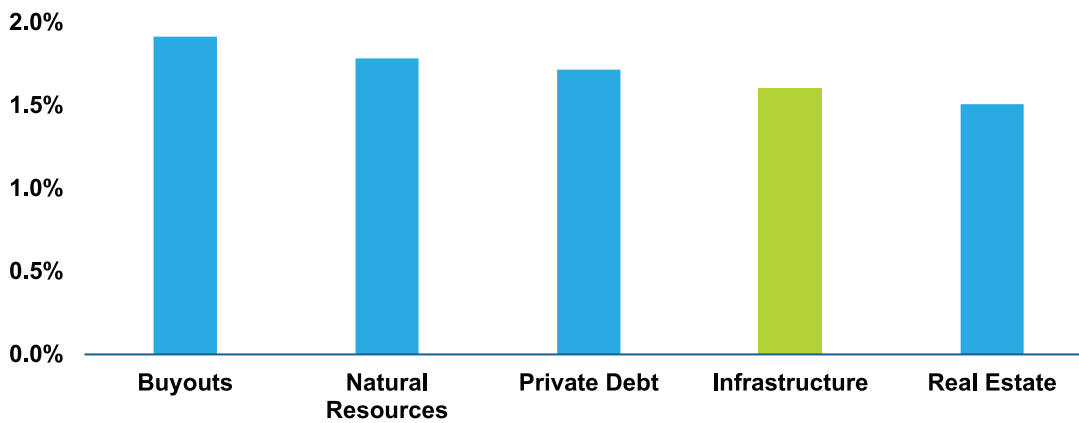
### **Capital deployment**

Closed-end infrastructure funds will typically call most of an investor's commitment over a three- to five-year investment period, similar to other private market strategies. While most managers will be able to give investors periodic estimates of the pace of future capital calls, there will be some lack of predictability in the short term given the rate of deal flow, deal execution and closing, and forward activities.

Furthermore, it is not uncommon to see the pace of deployment slow during economic downturns or periods of uncertainty and accelerate during bull markets. The converse can also be true where some deal flow picks up during times of distress and slows down when prices are richer. These dynamics can create challenges for investors in managing liquidity to fund capital calls as they are received, perhaps even on short notice.

### **Fees**

The fees and additional expenses on private infrastructure funds are typically higher than public market options, and generally include both a management fee and a performance-based fee (a.k.a. "carry") that kicks in above a pre-specified preferred return (a.k.a. "hurdle"), as with many private market investment vehicles. In comparison to other private markets asset classes, infrastructure is closer to the lower end of management fees (see Figure 15). Across infrastructure funds, the management fee and carry tend to be lower for core funds and higher for value add and opportunistic strategies. For example, base management fees can range from 75 basis points up to 200 basis points, carry from 0% to 20%, and hurdles from 0% to 9%, with a 50% to 100% catch up. Investors making large commitments often receive lower fee rates at one or more break levels.



**FIGURE 15**  
**Mean Management Fee**  
**(average 2005-2022)**

Source: Preqin, "2022 Private Capital Fund Terms Advisor," as of September 2022. Average annual mean management fee for the period 2005 to 2022.

## Summary

An allocation to private infrastructure may provide several benefits to institutional portfolios, from diversification and downside protection to serving as a hedge against asset depreciation during high inflationary periods.

Infrastructure's underlying assets have long useful lives and derive value from their intrinsic physical qualities. Since the asset class became more prominent in the early-to-mid 2000's, the number of funds in the market each year has roughly tripled since the Global Financial Crisis. However, infrastructure is still only a small piece of the overall private markets space, at an average of 9% of total AUM in the last ten years.

Infrastructure encompasses a wide variety of strategies with respect to their level and type of risk, as well as their return potential. Core and core plus strategies target the lowest risk-return level. Value add strategies target the middle of the risk-return spectrum, while opportunistic strategies target the highest risk-return. There are also a multitude of sectors that infrastructure funds invest in, with many funds investing in more than one sector. Both core/core plus and non-core private infrastructure have historically provided protection during inflationary periods where many traditional financial assets have depreciated in value. Both core/core plus and non-core private infrastructure have also generated better returns than public equities during times of historical market downturns.

Finally, the infrastructure asset class is accessible to institutional investors of all sizes, from the typical approach of investing via commingled partnerships, to the largest investors that can commit to separate accounts, co-investment vehicles, and direct investments. Investing in private infrastructure involves taking on risk as well as navigating some challenges that are particular to most private markets. These challenges include, but are not limited to, the use of leverage, illiquidity, dispersion in fund returns by manager and vintage year, some lack of predictability around capital deployment, and fees that may create a meaningful gap between gross and net returns to investors.

As always, investors should conduct careful due diligence to make sure that investments match their objectives and constraints.

## Appendix

### Meketa's inflation scenario analysis

- Meketa's Inflation Scenario Analysis is for the period April 2003 - December 2022.
- The Scenario Analysis is based on a generalized linear regression ("GLS") model that estimates the effects of realized and surprise inflation on monthly asset returns, controlling for the economic environment. The GLS model assumes a residuals autocorrelation of 1. Quadratic independent variables are added to the regression model to account for potential non-linearity between an asset class and inflation. Estimated scenario returns at the asset class level are then calculated as the expected value of asset class returns, conditional on the inflation scenario.
- Inflation is the monthly change in CPI from the 3-month rolling average CPI, surprise inflation is the difference between this month and last month's inflation rate, and GDP Growth is the percent change in GDP from the previous quarter. Inflation and GDP data are taken from the St. Louis Federal Reserve Bank's FRED database.
- Inflation meaningfully higher than expected is when surprise inflation is in the 75th percentile of positive, historical surprise inflation.
- High Growth and High Inflation is when real GDP growth is the 75th percentile of historical GDP growth and inflation is in the 75th percentile of historical inflation.
- Low Growth and High Inflation is when real GDP growth is the 25th percentile of historical GDP growth and inflation is in the 75th percentile of historical inflation.
- Indices Used: Russell 3000 TR, Cambridge Core & Core Plus Infrastructure Composite, Cambridge Opportunistic Infrastructure Composite, Cambridge Value Added Infrastructure Composite.

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