Infrastructure: an Evolving Asset Class

Infrastructure is an asset class within broader real assets, a space that encompasses tangible assets or resources including real estate, land and natural resources, and commodities. Historically, infrastructure has been defined as the assets needed to operate a society or move people and physical goods, such as toll roads, bridges, airports and utilities.

Over the past decade, this asset class has grown dramatically beyond the standard categories to include more modern infrastructure that reflects broader transformations within our economy, such as the transition to a digital world and energy transition support. As the investable universe of infrastructure expands, the governmental stimulus and private capital flowing into the asset class show societal support for continued investment.

Infrastructure investment opportunities include:

Energy

- Energy Storage
- Operating Renewables
- Midstream

Social

- Education
- Recycling
- Health Care

Utilities

- Power Networks
- Smart Grids
- EV Charging / Batteries

Digital

- Towers
- Data Centers
- Fiber
- Cloud Computing

Transport

- Parking
- Toll Roads
- Airports / Aircraft Leasing
- High-Speed Rail

Past performance does not guarantee future results.

The Role of Infrastructure in a Portfolio

Infrastructure is typically considered alongside other private asset classes in a portfolio, such as private equity, private credit, real estate and hedge funds. As clients continue to seek diversification in their portfolio and investments with lower correlation to the broader markets, private infrastructure is a differentiated option with inherent downside protection due to the underlying hard assets addressing critical needs to society.

Including infrastructure in a portfolio can offer the following unique benefits and considerations:

Inflation hedge and income

- Many infrastructure assets have long-term contracts with inflationary protection built into their pricing structures which provides stable, consistent cash flow.
- Despite market conditions, infrastructure assets commonly provide critical solutions to society, providing a level of demand inelasticity and an ability to keep up with inflation due to built-in price escalators.

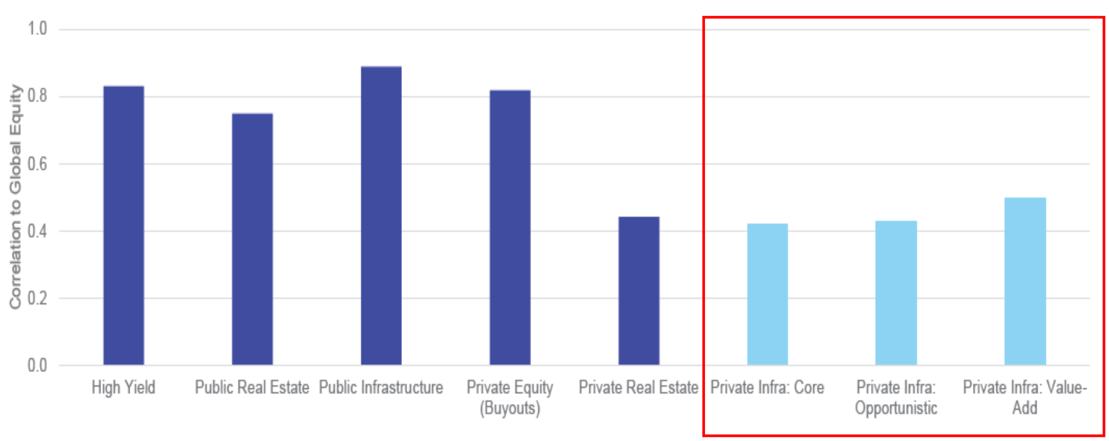
Low correlation to broader markets

- Given ties to essential services and the long-term, contracted cash flows, private infrastructure offers insulation from economic cycles and factors.
- This has been exhibited via less correlation to the broader market than traditional asset classes, such as public equities and fixed income (see Exhibit A).

Stable, risk-adjusted returns

- Private infrastructure provides essential services to society. This asset class is typically supported by regulation and often monopolistic positions in existing markets that support consistent yield and allow the asset class to be more stable throughout economic cycles.
- Alongside stable cash flows, private infrastructure can provide additional upside potential for investors, with scale to build platforms and drive operational initiatives.

Exhibit A: Correlation to Public Equity (Source: GSAM)[1]



Past performance does not guarantee future results.

Market Opportunity

In an environment of rising inflation, slowing growth and omnipresent market uncertainty, defensive and resilient cash-flowing businesses that are uncorrelated to the broader market are an attractive complement to a client's overall portfolio. Infrastructure companies aim to serve society's critical needs, making the asset class more defensive, including during periods of volatility. Infrastructure supports many of the current global megatrends such as energy transition and growing digital connectivity, creating an increased need for private capital in the market.

Private infrastructure assets under management (AUM) have surpassed $1 trillion and are expected to increase to more than $3 trillion by 2035, driven by growing demand from investors for defensive, stable asset classes[2]. Private capital investors are conscious of future-proofing their assets or their portfolio companies' assets through the lens of climate policy and guidance, leading to amplified investments in digital infrastructure, energy transition and renewables, transportation and essential services opportunities. Select themes are described in further detail on Page 5.

Recent policy updates in the United States also support private equity investment in infrastructure. In 2021, Congress passed legislation to deliver $1.2 trillion of government funding to infrastructure assets through the Infrastructure Investment and Jobs Act. Many political and financial analysts believe the bill will pave a long runway of infrastructure growth and innovation, creating a real opportunity for private investors to invest independently or partner with government agencies. Increased funding from the U.S. government makes infrastructure investments — which were once considered uneconomical — more attractive for private investors, providing a net benefit to the country's infrastructure by creating jobs and driving economic growth[3]. Private equity investments will go to service providers in the infrastructure sector, such as engineering firms, water-service companies, data center leasers and, to a lesser extent, direct private investment in infrastructure assets.

In 2022, Congress passed the Inflation Reduction Act (IRA) which, among other key items, provided an unprecedented financial commitment by the U.S. government to global decarbonization, with around $369 billion in funding for energy security and climate change programs. Policies and regulations, such as the 2021 Jobs Act and the IRA, provide a compelling backdrop for investing in infrastructure, and energy transition and sustainable infrastructure are poised to benefit from this legislation.

Fundamentals of Investing in Infrastructure

Infrastructure serves a critical role in society and is characterized by **defensive and contractual cash flows, resiliency through economic cycles, limited competition and incumbency advantages.**

Today, a broad set of real assets are categorized as infrastructure investments if they generate relatively predictable, long-term cash flows, often with inflation-hedging components and limited cycle risk. As with real estate, there are a variety of ways to invest in infrastructure depending on investor-level liquidity and risk / return objectives.

Different infrastructure strategies provide varying levels of income, appreciation and stage exposure:

	Core	Core-Plus	Value-Add	Opportunistic
Return Drivers	Mainly income	Income with some capital appreciation	Income and capital appreciation	Mainly capital appreciation
Typical Holding Period	7-10+ years	6-9 years	~5-7 years	~3-5 years
Yield Profile	60%+ of total return	~50% of total return	0-20% of total return	0-10% of total return
Investment Profile	Brownfield assets with long-term contracts with governments or creditworthy counterparties	Mostly brownfield assets with long-term contracts with greater scope for capital appreciation	Brownfield or greenfield assets with shorter-term contracts or less creditworthy counterparties; reliant on capital expenditure	Brownfield or greenfield assets with long-term contracts in developing markets or with revenue volatility
Typical Subsectors	• Gas, electric, utilities • Contracted, renewable power • Top-tier airports, seaports or toll roads in major markets	• Thermal power • Renewable power generation with development risk • Oil and gas midstream • Toll roads, airports or seaports with limited population coverage	• Greenfield assets under construction • Early-stage oil and gas midstream • Data centers and fiber-optic networks	• Assets in developing markets • Special or distressed situations • Merchant power generation

Lower Risk ⟷ **Higher Risk**

Please note the yield profiles displayed are samples and are for illustrative purposes only. No returns are guaranteed.

Select Investable Themes

The infrastructure industry is responding to market dynamics as well as widespread, changing consumer and business practices. Two newer areas of increased investment include:

1 Energy Transition and Sustainable Infrastructure

- *Defined as:* Companies managing assets that support renewable energy production, storage and distribution.
- *Examples:* Solar or wind farms (and related transportation assets), electric vehicle charging stations and battery storage.

Investment in sustainable infrastructure funds has heightened in recent years due to:

i. The focus around climate change and the urgency of scaled intervention
ii. Required updating of existing U.S. infrastructure, which has low condition ratings, through the lens of future systems and structures (which are typically more sustainability-focused)

Policies and regulations, such as the Inflation Reduction Act, are currently supportive of renewable power and the energy transition, and sustainable infrastructure is poised to benefit from this moment. However, a shift in sentiment could expose the sector to policy risk. Infrastructure is highly regulated, and any non-compliance exposes companies to financial, reputational and legal risk.

2 Digital Infrastructure

- *Defined as:* Companies managing assets that facilitate the digital world.
- *Examples*: Telecommunication towers, data centers, fiber-optic networks and cloud computing.

Investment in digital infrastructure funds has heightened in recent years due to:

i. The digitization of commerce and the broader economy
ii. The rise of artificial intelligence (AI), machine learning (ML) and related technologies across business sectors requiring more data
iii. Lack of supply to meet the demand in emerging economies and rural areas of developed economies

Digital infrastructure assets, such as data centers, are ripe for private investments due to the capital intensity required to build and operate them, and the often robust, consistent cash yield provided once they are developed.

Determine if infrastructure is right for your needs and risk preferences.

Investors should consider their existing holdings and the risks associated with investing in infrastructure. If you would like to discuss these trends further, please reach out to your Goldman Sachs team.

Endnotes

[1] Goldman Sachs Asset Management. Private assets: Cambridge; public assets: Reuters Eikon. Global equities proxied by the MSCI World index, global high yield Bonds proxied by the Bloomberg Barclays Global High Yield index, public infrastructure proxied by the S&P Global Infrastructure index, public real estate proxied by the NAREIT index. Data for 20 years through 2Q 2022.

[2] McKinsey, "Investing in Infrastructure for a 'green recovery'", January 2021. https://www.mckinsey.com/capabilities/operations/our-insights/investing-in-infrastructure-for-a-green-recovery

3 Wall Street Journal, "Investment Impact of $1 Trillion Infrastructure Measure Seen as Mixed", January 2022. https://www.wsj.com/articles/investment-impact-of-1-trillion-infrastructure-measure-seen-as-mixed-11641556801

Other resources referenced:

- Goldman Sachs Asset Management, "Infrastructure Overview Materials", 2023.
- Goldman Sachs Asset Management, "Infrastructure in Inflation: the Coming Dispersion", December 2022.
- Mercer, "Infrastructure Investing – a Primer", 2021.

Endnotes

General Disclosure

This material is provided for informational purposes only and should not be construed as investment advice or an offer or solicitation to buy or sell securities. This material is not intended to be used as a general guide to investing, or as a source of any specific investment recommendations, and makes no implied or express recommendations concerning the manner in which any client's account should or would be handled, as appropriate investment strategies depend upon the client's investment objectives. The portfolio risk management process includes an effort to monitor and manage risk, but does not imply low risk.

Past performance does not guarantee future results, which may vary. The value of investments and the income derived from investments will fluctuate and can go down as well as up. A loss of principal may occur.

This material contains information that discusses general market activity, industry or sector trends, or other broad-based economic, market or political conditions. It also pertains to past performance or is the basis for previously-made discretionary investment decisions. This information should not be construed as a current recommendation, research or investment advice. It should not be assumed that any investment decisions shown will prove to be profitable, or that any investment decisions made in the future will be profitable or will equal the performance of investments discussed herein. Any mention of an investment decision is intended only to illustrate our investment approach and/or strategy, and is not indicative of the performance of our strategy as a whole. Any such illustration is not necessarily representative of other investment decisions.

This overview is strictly confidential and may not be reproduced or provided, in whole or in part, to any other party without the express written consent of Goldman, Sachs & Co., and should be returned upon the request of Goldman, Sachs & Co. The information contained herein has been prepared internally by Goldman Sachs and has not been verified by third party sources. This information should not be relied upon for the purpose of investing in current or any future product, or for evaluating any existing investment you may have in a Goldman Sachs product, or for any other purpose.

Any information herein regarding investment returns is merely estimated and should not be considered indicative of the actual returns that may be realized by a Goldman Sachs investment product or predictive of the performance of an investment. Further, the information contained herein includes observations and/or assumptions and involves significant elements of subjective judgment and analysis.

No representations are made as to the accuracy of such observations and assumptions and there can be no assurances that actual events will not differ materially from those assumed. In the event any of the assumptions used in this presentation do not prove to be true, results are likely to vary substantially from those discussed herein. Opinions expressed are current opinions as of the date appearing in this material only. This presentation is for informational purposes only with respect to certain investment products that Goldman, Sachs & Co. may offer in the future. It does not constitute an offer to sell or a solicitation of an offer to buy an interest in any Goldman, Sachs & Co. product to any person in any jurisdiction in which such offer or solicitation is not authorized or to any person to whom it would be unlawful to make such offer or solicitation. Any such offering will be made only in accordance with the terms and conditions set forth in a private placement memorandum pertaining to any such product.

Investors are urged to consult with their financial advisors before buying or selling any securities. The material provided herein is for informational purposes only. It does not constitute an offer to sell or a solicitation of an offer to buy any securities relating to any of the products referenced herein, notwithstanding that any such securities may be currently being offered to others. Any such offering will be made only in accordance with the terms and conditions set forth in the offering documents pertaining to such Fund. Prior to investing, investors are strongly urged to review carefully all of the offering documents.

No person has been authorized to give any information or to make any representation, warranty, statement or assurance not contained in the offering documents. THIS MATERIAL DOES NOT CONSTITUTE AN OFFER OR SOLICITATION IN ANY JURISDICTION WHERE OR TO ANY PERSON TO WHOM IT WOULD BE UNAUTHORIZED OR UNLAWFUL TO DO SO.

This material is provided for informational purposes only and should not be construed as investment advice or an offer or solicitation to buy or sell securities. This material is not intended to be used as a general guide to investing, or as a source of any specific investment recommendations, and makes no implied or express recommendations concerning the manner in which any client's account should or would be handled, as appropriate investment strategies depend upon the client's investment objectives. Although certain information has been obtained from sources believed to be reliable, we do not guarantee its accuracy, completeness or fairness. We have relied upon and assumed without independent verification, the accuracy and completeness of all information available from public sources.

Conflicts of Interest

There may be conflicts of interest relating to the Alternative Investment and its service providers, including Goldman Sachs and its affiliates. These activities and interests include potential multiple advisory, transactional and other interests in securities and instruments that may be purchased or sold by the Alternative Investment. These are considerations of which investors should be aware and additional information relating to these conflicts is set forth in the offering materials for the Alternative Investment.

This material is intended for educational purposes only and is provided solely on the basis that it will not form a primary basis for any investment decisions.

Investment Risks and Information. Risks vary by the type of investment. Additional information regarding investments and risks may be available in applicable product materials. Before transacting or investing, you should review and understand the terms and the nature and extent of the associated risks, and you should be satisfied the investment or transaction is appropriate for you in light of your individual circumstances and financial condition.

Endnotes

Alternative Investments ("AI"). AIs may involve a substantial degree of risk, including the risk of total loss of an investor's capital and the use of leverage, and may not be appropriate for all investors. Private equity, private real estate, hedge funds, and IA investments structured as private investment funds are subject to less regulation than other types of pooled vehicles and liquidity may be limited. Review the Offering Memorandum, Subscription Agreement, and any other applicable offering documents for risks, potential conflicts of interest, terms and conditions and other disclosures.

Real Estate. Real estate investments involve additional risks not typically associated with other asset classes, such as sensitivities to temporary or permanent reductions in property values for the geographic region(s) represented. Real estate investments (both through public and private markets) are also subject to changes in broader macroeconomic conditions, such as interest rates. Investments in a portfolio of equity investments in issuers that are primarily engaged in or related to the real estate industry, including real estate investments trusts ("REITS") and non-traded REITS, may carry additional risks not typically associated with other asset classes. Investing in non-traded REITS involves certain unique risks in addition to those risks associated with investing in the real estate industry in general. Non-traded REITS consist of shares that are not listed on any national securities trading exchange, and can sometimes: (i) not own real estate assets or have specified real estate assets at the time of public offering; (ii) offer limited liquidity through a share-redemption program; (iii) emphasize anticipated income as being a percentage of sale price; and/or (iv) be managed by an external, third party manager which is an affiliate of the non-traded REIT. As such, non-traded REITS may carry a higher risk of illiquidity, incomplete or nontransparent valuations, dilution of shares, and conflicts of interest. Review and understand all non-traded REIT prospectuses before investing in non-traded REITS.

No Distribution; No Offer or Solicitation. This material may not, without GS' prior written consent, be (i) copied, photocopied or duplicated in any form, by any means, or (ii) distributed to any person that is not an employee, officer, director, or authorized agent of the recipient. This material is not an offer or solicitation with respect to the purchase or sale of any security in any jurisdiction in which such offer or solicitation is not authorized or to any person to whom it would be unlawful to make such offer or solicitation. We have no obligation to provide any updates or changes to this material.