

Investing in Developed Country Private Infrastructure Funds

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Introduction

Investing in infrastructure involves applying private sources of capital to achieve meaningful public ends by investing in equity, equity-linked and debt instruments of businesses that design, build, operate, own or have long-term concessions¹ in physical assets. These physical assets are those that provide essential services to a society. Good infrastructure facilitates the growth of businesses, promotes trade and enhances economic welfare by improving access to vital resources. This, in turn, furthers demand for infrastructure.

Infrastructure businesses have traditionally been within the purview of government ownership and of public finance. While the need for infrastructure investment remains high and continues to grow, public funding for infrastructure has declined considerably over the past few decades in the absence of a commensurate increase in taxes. As a result, historical under-investment, accompanied by a diminished role of government in many countries, is leading to increased reliance on the private sector. This is being addressed through privatization and the outsourcing of new projects. Regulatory and structural changes in North America, U.K., Western Europe and Australia are further catalyzing this change. Formal contracting structures through active Public Private Partnership (“PPP”)² programs as well as policy shifts towards “maximizing value for money” propositions typify these changes. This has led to a convergence of public and private sector financing and operational participation in infrastructure businesses.

This huge and dramatically expanding financing need in mature markets, let alone those in developing countries, is creating a substantial investment opportunity. This demand is drawing large and growing alternative investment global capital inflows. Institutions that are not currently invested in infrastructure are undertaking efforts to quickly assess this opportunity and put into place policies, dedicated investment teams and allocation guidelines.³ Institutional investors in this area include dedicated infrastructure funds, insurance companies, pension funds, sovereign wealth investment funds, private equity funds, divisions of large construction companies and banks. Financial investors are also forming alliances with multi-national infrastructure operating companies to invest in infrastructure opportunities.

Globally, approximately 70 infrastructure funds seeking around \$30 billion to \$50 billion in equity will be at various stages of capital raising over the next six months. Over the past two years, around 30 dedicated funds have been launched and \$40 billion to \$60 billion⁴ of equity capital has been raised for investing in the developed markets of Europe and North America alone. With infrastructure assets often levered approximately 60% to 75% (debt to total capital), we estimate that these funds can invest in assets totaling around \$150 to \$200 billion of enterprise value. This significant availability of capital still falls materially short of annual developed markets investment needs, which we envisage are in the vicinity of \$500 to \$800 billion.

Infrastructure investments have different risk and return profiles from traditional investments. These differences can be a source of both alpha as well as a valuable investment diversification tool for investors. Typically, demand for infrastructure services is largely inelastic and is relatively unaffected by the business cycle, resulting in a relatively low correlation between returns on infrastructure and market returns.

¹ A concession in the context of infrastructure is a contract between a private company and the governmental body that owns the infrastructure asset. The contract provides the former an exclusive right to operate, maintain and carry out investment and business activity for a number of years and to charge user-based fees—tolls in the case of a road or bridge—at a stipulated tariff rate.

² Public-private partnerships are partnerships between government and private sector companies with the latter providing services for assets owned by the former. For large build/buy/operate and maintain mandates it is not uncommon for a private sector consortium to form a special purpose vehicle (“SPV”) to execute the various related tasks.

³ For a sample list of recent infrastructure funds see “The Rise of Infra Funds,” Global Infrastructure Report 2007, Project Finance International.

⁴ CAI Research.

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Other infrastructure asset characteristics are elaborated on later in this article.

The U.S., Canada, U.K., Western Europe and Australia are at different stages of maturity when it comes to deploying private financing vehicles for meeting public ends. However, they all share one thing in common, namely, that the market opportunity over the next decade is significant.

This paper discusses infrastructure from an alternative investments perspective. It outlines the rationale for investing in developed country infrastructure and describes the global market opportunity segmented by geographic regions. It also touches upon regulatory and public policy issues and their effects on the investment opportunity set. Infrastructure's risk/return characteristics and developing trends are also presented with a view to its potential role in investment portfolios.

Infrastructure Assets

Opinions differ as to what constitutes an infrastructure asset of a country or economy. For example, banking and financial systems being essential to the social and economic fabric of a country may be argued to be part of infrastructure. However, for the purposes of considering infrastructure as an investment class, it is generally accepted that it must meet certain criteria to be included:

- Comprise large, stationary, physical assets with a long useful economic life
- Consequently high capital costs
- Low operating costs once construction is complete (e.g., high EBITDA margins)
- Support the overall functioning of society

Within this description, infrastructure can be categorized as either economic infrastructure or social infrastructure.

“Economic infrastructure” assets are those where the users (be they households, passengers, commercial entities, etc.) have the means and the will to pay for the service provided. Consequently, these assets derive revenues principally from consumers or corporate customers. Economic infrastructure sectors may include:

- Transportation: Bridges, tunnels, roads, railways, urban transit, maritime ports, airports
- Energy: Electricity generation (excluding merchant generation with concomitant price risk), transmission, distribution, oil and gas pipelines, storage
- Communications: Cables, towers and transmission networks
- Water: Treatment plants, distribution systems, sewage and wastewater facilities

“Social infrastructure” assets are those where the user is unable and/or unprepared to pay for the service. Consequently these assets derive their revenue principally from government payments. Where social infrastructure is provided by the private sector, it is almost always under some form of PPP; a long-term concession with defined scope and payment mechanism, financed with private sector capital. Social infrastructure sectors may include:

- A range of accommodation facilities (e.g., provision of buildings, maintenance and facilities management) for public services, potentially including hospitals, schools, courts, prisons, barracks and government offices
- Shadow toll roads (where the operator is compensated by government, rather than by tolling motorists)
- Public transport

The degree of private investment within infrastructure depends on the commercial viability of the sector or sub-sector as well as the governmental policy within a given country. Private sector participation in economic infrastructure relies on a government that is content for essential assets to be operated by the private sector, which charges the citizens for its services (often within a regulated pricing structure). It also relies on the customers' propensity to pay, e.g., toll roads have been historically unpopular with many electorates; consequently new roads are often procured as “shadow toll” PPPs, so that motorists do not pay

the tolls. In developing countries, users may be unable to pay, resulting in the need for government support. Private investment in social infrastructure depends on the government's ability to pay the private sector for the service and on the government's political support for PPP.

There are three key criteria that dictate the risk/return characteristics of infrastructure to a large extent:

Stage of Maturity: Investment in assets under construction is riskier than completed assets; investment in newly completed assets with no operating history (including usage) is riskier than investment in mature assets with established operations and usage history.

Geography: Political risk in developing countries is a key consideration given the essential nature of the assets to the local economy, the long life of the assets and the fact that they cannot be moved, making them vulnerable to expropriation. To mitigate this risk, many investors target only developed countries or developing countries with robust legal frameworks, particularly with respect to property protection and contract enforcement. The long payback period also increases the probability that an investment may be adversely affected by a period of severe economic instability (e.g., government default, hyperinflation). In compensation, many emerging markets are enjoying significant economic growth, which has strong direct benefits for infrastructure businesses.

Sector Scope: All else being the same, infrastructure businesses whose revenues are not subject to price and/or volume variations are less risky than those that are. Some social infrastructure PPP companies (e.g., for hospital facilities) may be paid by the government on an "availability basis," e.g., revenue is independent of usage and the service is compensated at a fixed price, with deductions only for poor service. Where there is volume risk, this may be mitigated by the nature of the service (e.g., provision of water to a given area) and/or by the monopolistic nature of the asset (e.g., being the only airport for a major city). Price risk may be mitigated by regulation that periodically determines price to provide a certain return on capital (e.g., for utilities) and/or by fundamental demand (e.g., for a toll road for a major corridor). To the extent that price and volume risk is not significantly mitigated, the asset may not be considered to be "infrastructure" for investment purposes. For example, power generators that sell electricity into a market at spot prices (e.g., it is "merchant" generation with no long-term power purchase agreements) is considered ineligible by many infrastructure investors.

The Opportunity

With few exceptions, underinvestment in infrastructure has been a global secular trend. In some instances the true economic cost is not passed on to consumers. In these situations, under-pricing tends to be subsidized by the government, which results in pressure on government finances. The cumulative adverse impact is underinvestment, lagged maintenance and inadequate infrastructure replacement. This in turn slows development, erodes productivity, and in some cases results in shifts of populations and industries to more infrastructure efficient geographic areas.

Governments have historically used bond financings, custom lease structures, special tax districts, tax incentives and credits, as well as usage fees, to facilitate funding of infrastructure projects. They are now increasingly turning to private capital to supplement or replace public financing. This trend began in Australia and the U.K. and carried over to Canada and continental Europe. It is now becoming increasingly important in the U.S. Significant policy work still remains to be done in most countries to expand private sector involvement in infrastructure, although many governments are increasingly focused on advancing such policies. For example, in the U.S. a number of drivers are catalyzing increased private sector involvement. They include, among others, (i) funding shortfalls at each level of government caused by limits on tax increases and available debt; (ii) divestitures of existing infrastructure assets to raise capital for new investments; (iii) initiatives to obtain private sector management and technical expertise to improve service efficiency; (iv) enactments of favorable PPP legislation by federal and state governments; and (v) availability of debt and equity financing from private investment sources.

Estimations and methodologies to determine infrastructure funding needs differ due to varying definitions of infrastructure as well as the level of subjectivity involved in assessing the need to renew, maintain or to add to existing assets. The American Society of Civil Engineers (“ASCE”) estimates that it would cost over \$1.6 trillion over the next five years to bring U.S. infrastructure up to a satisfactory standard.⁵ The World Bank⁶ estimates that middle and high income countries will require over \$740 billion per annum to be invested in infrastructure (excluding ports, airports and canals) through 2010. The Organization for Economic Cooperation and Development (“OECD”) estimates a worldwide investment need of about \$1.8 trillion per year.

The market for private investment in public infrastructure is expected to continue to grow in size, sophistication and opportunity. Over the past two years there have been over \$250 billion⁷ in infrastructure project transactions in Europe, U.S. and Canada as a result of PPP, mergers and acquisitions, and privatizations. While there is no firm consensus on this, an aggregation of media reports, press releases and other evidence, as well as announced deals in the pipeline, suggest that transaction volumes will exceed \$300 billion to \$500 billion per annum on a worldwide basis.

Private investors recognize this trend and have begun to raise dedicated infrastructure funds to address these opportunities. These infrastructure funds bring together capital from a variety of investors and allow for efficient deployment of equity capital.

Infrastructure Characteristics

The fundamental drivers of infrastructure revenues are changes in macroeconomic factors such as GDP and demographic trends. Growth in these factors increases usage-based revenue and positive cash flows for these assets. Infrastructure assets typically feature a set of common attributes which provide for defensive investment characteristics:

Inelastic Demand

Infrastructure assets and businesses provide essential services that support the functioning of society and the economy, such as power, water and basic transportation. Their indispensable nature results in their demand being relatively inelastic to price changes and economic downturns; their long-term growth is generally proportional to overall economic growth.

Monopolistic Market Positions

More often than not, infrastructure assets and businesses are natural monopolies with high barriers to entry. For example, an airport may be the only airport for a particular city and it may be uneconomic to build a competing airport, it may be difficult to get planning approval and the government may explicitly promise an operator not to permit the development of a competing airport in the catchment area.

Regulated Entities

Given the monopolistic nature of such infrastructure assets, governments (or government-sponsored agencies) typically regulate their activities and pricing to preclude undue monopolistic practices and extra-market returns at the expense of the consumer. As regulated entities, they are often required to sell their services at approved tariffs that are intended to generate sufficient revenues to fund operating costs plus a certain return on capital. Gas, electric, and water utilities as well as transmission assets are examples of these regulated businesses. Their effective management necessitates specialized understanding of the

⁵ “2005 Report Card for America’s Infrastructure,” updated 2008, American Society of Civil Engineers.

⁶ Fay, Marianne and Yepes, Tito, “Investing in Infrastructure: What Is Needed from 2000 to 2010?” World Bank Policy Research Working Paper No. 3102, July 2003.

⁷ CAI Research.

applicable regulatory framework as well as technical and industry expertise to generate attractive risk-adjusted returns. Under the right management, regulated assets may be particularly attractive investments because price regulation mitigates downside risk if costs increase. This is because prices will be allowed to increase to maintain the target return rate. Moreover, returns can still be improved by outperforming the regulator's assumptions for operating costs, capital costs and cost of capital.

Capital Intensive, Low Operating Costs

While infrastructure assets are capital intensive to set up (e.g., airports, bridges and tunnels), once established, they generally have relatively low operating costs. This provides for strong operating margins. This attribute, combined with their long projected service lives, supports high levels of leverage.

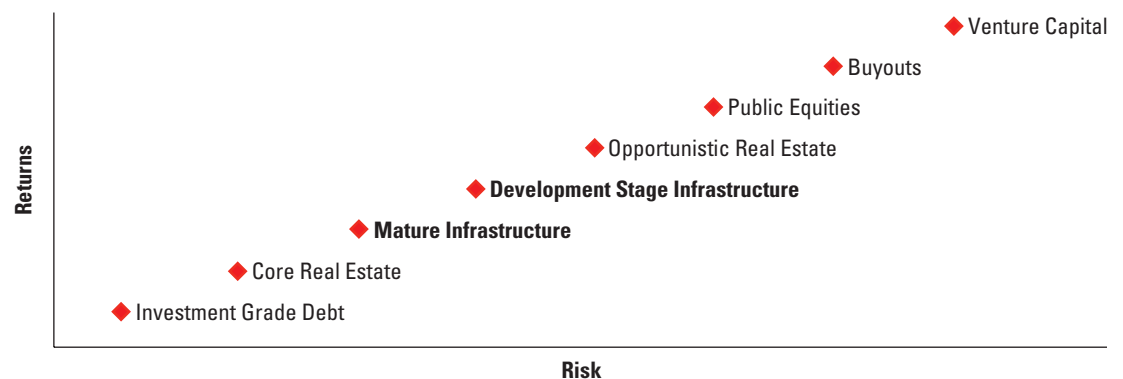
Low Volatility of Operating Cash Flow

In most instances, infrastructure investment revenue streams are relatively stable and predictable, often resulting from either a captive customer base, or from long-term contracts, or regulated pricing schedules, and limited competition or licensing. Utilities are an example. Stable cash flows can also support value-enhancing financial leverage at a more attractive cost of debt capital than otherwise similar financings undertaken by more risky assets, such as private equity buyouts.

Resilience to Economic Downturns

Due to their essential role in the economy, infrastructure businesses, once operational, are less likely to suffer from significant permanent decline in demand/traffic/patronage than businesses in other industries. They are expected to better weather downturns with the possible exception of cases where inappropriate capital structures have been used to finance their development (e.g., too much leverage) or when demand forecasts have been grossly inaccurate.

FIGURE 1: Risk/Return Profile by Asset Class



Source: CAI Research; Stylized Risk/Return graph.

Minimal Technology Risk

Infrastructure assets are not generally susceptible to technology obsolescence risk. For greenfield infrastructure that is reliant on technology (e.g., power generation), it is important to ensure the technology used is proven or that the risk of technology failure is otherwise mitigated.

Long-term Horizons

Infrastructure assets have long useful economic lives (often over 50 years). They produce stable revenues with relatively stable cash flows. This long-term predictability may be helpful to investors seeking to match long-term yielding assets against long-term liabilities (e.g., pension plan and insurance company liabilities).

Inflation Indexed Cash Flows

Infrastructure assets may have contractual or regulatory revenue structures that are adjusted for changes in measures of inflation, such as the Consumer Price Index, thus making for an effective inflation hedge. Their long-term inflation linked cash flow characteristics are attractive duration hedges for long-term liabilities.

Stable Yield

A consequence of the low operating costs and stable cash flows is the ability of mature infrastructure businesses to support relatively high dividend yields, typically mid to high single digit per annum, in conjunction with moderate capital appreciation. This contrasts with private equity or venture capital investments which are focused on capital growth for the great majority of the investment return.

Low Correlation with Other Asset Classes

Because of their muted cash flow volatility and relatively inelastic goods nature, infrastructure businesses are expected to exhibit a low correlation with the overall market thereby offering considerable portfolio diversification benefits.

Attractive Risk-adjusted Returns on Investment

Total returns from mature infrastructure investments tend to range in the low to mid teens, depending on various factors, including the sector and jurisdiction in which the business operates. For example, with exceptions, a mature regulated gas utility may generally be expected to provide a lower return to investors (due to the lower risk as a result of regulated nature of the business and reliability of future cash flows) compared with returns from investments in sectors such as airports and ports (in part due to variability of revenue as a result of exogenous factors).

These fundamental asset characteristics result in a unique combination of attributes for infrastructure equity as an investment class, which make it particularly attractive for a wide range of investors, especially those seeking to add long-dated, stable income-generating investments to their portfolio.

Infrastructure also has a number of risks associated with it, which should be mitigated where possible and reflected in return requirements where mitigation is not possible:

TABLE 1: Typical Risks⁸ in Infrastructure Investments

Risk Factors	Issue	Risk Mitigation Tactics
Construction	Delays, cost over-runs, disputes, accidents	Contracts that pass the bulk of risk to construction contractors
Demand and usage	Revenue shortfalls	Regulation, usage contracts, due diligence (e.g., traffic studies and downside modeling), operational expertise
Regulatory	Changes in commitment of government agencies and laws	Continuous communication and partnership approach with governments and regulators
Leverage	Financial risk	Prudent (quasi-investment grade) debt levels
Interest rate risk	Increases in financing costs	Hedging
Contingent liabilities	Purchaser indemnification	Insurance

Source: CAI Research.

Naturally, revenue and net cash flow projections are at the heart of a commercially successful infrastructure project. These projections are a function of, among others, accurate demand forecasts, predicted future rates and tariffs and inflation assumptions. A deep understanding of the dynamics of these variables is a prerequisite for successful infrastructure investing.

Accessing Infrastructure Investment Opportunities

Private participation in greenfield infrastructure projects is often led by construction companies and operators. They complement their own equity with debt from project finance banks and also look to dedicated infrastructure funds for additional equity. Mature infrastructure assets are often completely owned by financial investors.

There are various types of financial investors that seek to invest in infrastructure at the asset level. These include not only institutions such as insurance companies, pension funds, endowments, sovereign wealth investment funds and ultra-high net worth family offices, but also (i) infrastructure funds formed by banks and private sponsors that, in addition to their own capital, may raise third party funds; (ii) strategic buyers comprised of entities that may participate in one or more aspects of greenfield and/or brownfield stages, and for whom asset acquisition is a complementary strategy to spur growth; and (iii) buyout-type financial sponsors with customarily higher expected IRR targets, although they are becoming less prevalent in the infrastructure investment space as the sector continues to become more competitive. There may be a degree of overlap among these investor groups. Methods for investors to gain exposure to infrastructure equity, and their relative merits, are discussed next.

⁸ This is a partial list of risks. There are other risks that have not been highlighted here. There can be no assurances that these suggested strategies will have an impact, if any, on mitigating these risks.

Private Funds

There has been increased activity in setting up dedicated infrastructure funds. Around \$30 billion to \$50 billion of fund capital is currently being raised annually to buy equity stakes in utility companies, energy, water and transportation assets.⁹ Management teams with extensive backgrounds in infrastructure equity investment and asset management, project finance, M&A, investment banking and industry help run these funds. These funds are less volatile than their public market equivalents, have private equity type redemption, participation and management fee terms, and may offer access to active managers. Private infrastructure funds display many similarities to private equity buyout funds but they do differ in certain important respects. Most noticeably, the difference lies in current income distribution and relatively protracted capital returns schedules, given their long-dated cash flows.

Private infrastructure funds are typically closed-end funds with finite lives of around 10 to 15 years. The underlying assets are typically longer-term holdings that generate cash flows and current income over more than 20 years. Capital gains typically only occur upon the partial or complete disposition of these holdings though they may also be realized during the fund's lifetime through refinancing.

The terms for privately placed infrastructure funds closely mirror those for private equity buyout funds. Typical investing terms are summarized in Table 2:

TABLE 2: Typical Investing Terms

Fund structure	(i) Limited Partnership; (ii) Fund manager; (iii) LLC as a General Partner; (iv) Parallel Funds to accommodate different investor types
Fund size	> = \$300 million; more recently \$1 billion to \$5+ billion
GP participation	> = 1% of capital commitments (for some recent bank-sponsored funds this figure is higher)
Closings	One or more within 12 months of initial closing with subsequent investors contributing proportionate share and interest for management fee
Management fee	1.5% per annum, some with decreasing fees depending on larger commitment size
Other optional fees	Financing fees, acquisition fees, monitoring fees
LP preferred return	Typically 8%
Returns expected by investors ¹⁰	Low- to mid-teens (gross) depending on the type of fund
Carried interest	20%; including up to and or above LP preferred return with 100% or 80/20 catch-up. Some funds have developed their own structures to attempt better alignment of the manager with investors over a long fund life
Investment period	Typically four years
Fund life	10, 12 or 15 years
Leverage	Assets financed with investment grade debt financing, typically around 60% to 75% of total capital
Co-investment provisions	Discretionary opportunities for large investors
Distribution, drawdown, claw back, organization expenses, etc.	Typical private equity fund terms

Source: CAI Research.

⁹ CAI estimates.

¹⁰ CAI estimates only. Past performance is not indicative of future performance.

There are certain specific risks of investing through funds versus investing directly in assets or stocks, as shown in Table 3 below.

TABLE 3: Typical Risks ¹¹ in Infrastructure Funds		
Risk Factors	Issue	Risk Mitigation Tactics
Operating history	New funds and teams sometimes do not have operating history	Team experience and track record in similar strategies may be transportable
Lack of diversity in investments	Geographical, stage and sector concentration	Conscious strategy to diversify and source underlying deals; weak correlation between investments
Long-term illiquid investments	Disposition issues and macro economic cyclicality	Robust demand for infrastructure equity provides exit opportunities if required
Asset level management	Third-party contractors and agency issues	Alignment of interest articulated in shareholder agreements and governance arrangements
Market conditions	Impact on acquisition and disposition prices	Strategic non-auction approaches for acquisition; flexibility on disposition timing

Source: CAI Research.

Publicly Traded Funds

Listed funds are more liquid than private equity funds and have an indefinite life. Historically, publicly traded infrastructure funds have often specialized in specific sub-sectors of infrastructure. However, some recent funds have begun to invest across diversified infrastructure sectors and geographies. Although the investment, legal and governance structures of publicly traded funds differ significantly from those of private funds, the management objectives are largely similar: to build a diversified portfolio of infrastructure equity investments that provide investors with the attractive investment attributes associated with the asset class.

However, there are certain disadvantages for publicly traded funds. As for any publicly listed stock, the price may be potentially volatile. Also, a public fund cannot easily call capital from investors when it is needed to make an investment; instead public funds must raise excess cash (resulting in dividend yield “drag”) and/or execute follow-on issues to fund new investments (meaning that bids must be contingent on a successful equity issuance).

Publicly traded funds are also subject to the same fund-specific risks as private funds.

¹¹ *Ibid.*, footnote 8.

Direct Deals

Direct investing in infrastructure assets requires an understanding of the asset, its operation, regulatory regimes and financial structures. While dispensing with management fees it also requires considerable experience in sourcing, screening, selecting, structuring, bidding, negotiating and managing infrastructure assets. Many institutional investors do not possess the management skills, resources and expertise to make direct investments in infrastructure through acquiring equity stakes or entering into joint ventures with construction companies and project operators. It may not be their core competency as asset allocators. There is also a significant cost to attract and retain a team of suitably qualified high caliber individuals. Nevertheless, some long-standing infrastructure investors, as well as new investors, have assembled qualified and talented infrastructure teams. This skill set, coupled with resources to make significant allocations, makes them very competitive direct investors in infrastructure deals globally.

Direct investments also require very large outlays, create deal concentration risk and reduce diversification. There is also the consideration of success rate. Unless an institution builds a large high quality team and/or has exclusive relationships with leading partners it may only be able to bid for a small number of transactions each year; this has the effect of slowing down the effective pace of investing. A number of leading infrastructure institutions complement a direct investment strategy with investment in external funds.

Publicly Traded Infrastructure Companies

Currently, while the total size of the global equity market is around US\$43.8 trillion, listed infrastructure is estimated at US\$2.1 trillion.¹² However, this figure includes large utility, telecommunications and energy companies that have some infrastructure assets (e.g., power transmission and distribution) but also a proportion of assets that are not infrastructure as we have defined earlier (e.g., merchant power generation). This proportion may represent a significant majority of the enterprise value of such companies. For pure play infrastructure investment, there is a much smaller subset of quoted stocks for investors to choose from, including certain utilities, airport companies and toll road companies. Furthermore, the traditional preferences of the public market (e.g., low leverage and steady, as opposed to maximized, dividends) mean that publicly traded companies are not necessarily managed to optimize the investment characteristics described earlier.

We highlight in Table 4 the essential differences within private infrastructure funds, publicly traded infrastructure funds, direct infrastructure investments and publicly traded companies.

¹² "Listed Infrastructure Assets," Standard & Poor's, April 2008.

TABLE 4: Comparison of Private, Public and Direct Investments

	Private Infrastructure Funds	Publicly Traded Infrastructure Funds	Direct Deals	Publicly Traded Companies
Diversification	Diversified exposure to a number of assets	Diversified exposure to a number of assets	Typically higher asset concentration, dependent on size of stakes targeted	Dependent on target size for each shareholding
Size of investment	High single commitments	Low; at price of traded share	Can be very high	Low; at price of traded share
Correlation	Low with other asset classes	Low with other asset classes but subject to market factors that increase correlation	Low with other asset classes	Low with other asset classes but subject to market factors that increase correlation
Fees and expenses	1.5% fee + carried interest (typical private equity terms)	1.5% of market value + carried interest	Varies depending on resources expended	None
Liquidity	Illiquid; distributions over 10 years plus	Very liquid; daily market traded, although often at lower volumes than other equities	Illiquid; dependent upon interest in the particular stake	Very liquid; daily market traded
Valuation volatility	Low volatility; appraisal-based valuation	Daily market volatility	Low volatility; appraisal or transaction based	Daily market volatility
Access	To qualified investors only	To both retail and institutional investors	To large investors with transaction capability	To both retail and institutional investors
Tactical asset allocation opportunity	Low	Very high	Low	Very high

Source: CAI Research.

Classifying Infrastructure Fund Strategies

Within the broad umbrella of infrastructure funds, various managers operate a range of investment strategies. These strategies may provide significant variation of investment characteristics. Therefore, investing strategy should be a key consideration for investors when assessing where an infrastructure fund belongs within an alternative investments portfolio.

Active vs. Passive

Active Management: Some fund managers seek to make investments where their stakes afford them control or joint control. Such active managers will work closely with their portfolio companies on a range of strategic, financial and operational issues, providing expertise from within the manager's organization and holding significant influence over day-to-day decision-making. These managers often seek the ability to appoint the CEO of the asset companies as a means of ensuring that their strategy is implemented. In order to achieve controlling stakes, active managers may have to invest significant amounts leading to fewer, larger investments in their portfolio.

Active management in infrastructure has many similarities to the management approach of buyout funds. However, for the most part, infrastructure funds seek companies that require incremental improvement, rather than sweeping strategic changes that typically attract buyout funds.

Passive Management: Other managers are content to hold minority stakes that leave other investor(s) (or government shareholders) with control. Such passive managers monitor their portfolio companies closely and offer input on certain areas (e.g., financing) that may add significant value. However, to a large extent, they allow others to manage the assets and they have less influence in decision making. These managers typically require representation at the asset company board in order to effectively monitor their investments and to ensure that their interests are not compromised. Passive managers may be able to make smaller individual investments and thus hold a larger number of investments within their portfolio.

Passive management strategies may have more in common with those in core real estate funds. Managers of infrastructure funds will rarely describe themselves as passive, although this may be implicit from their strategy and investing history.

In practice, many managers are open to active or passive investments, although they may lean more in one direction or another.

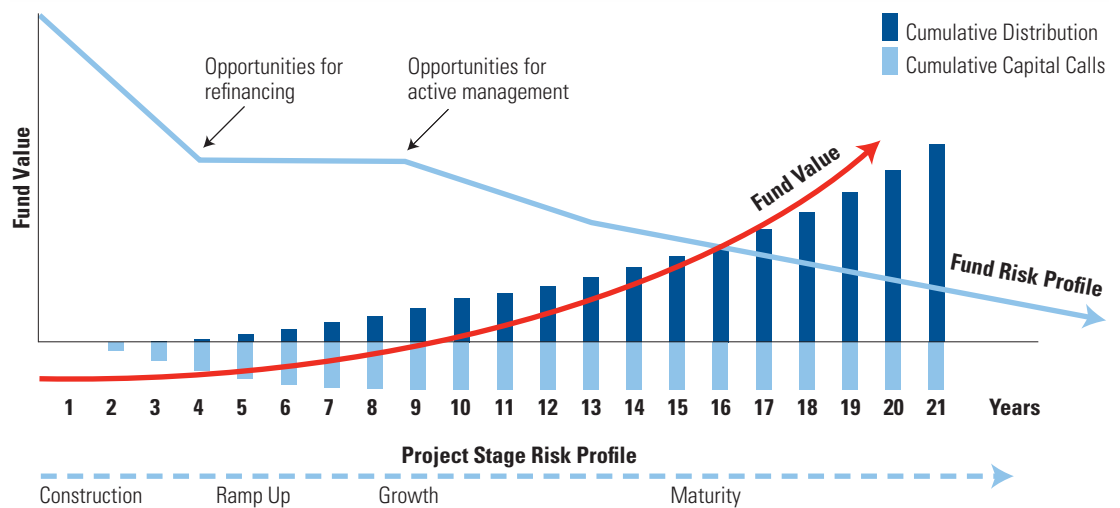
Asset Maturity

Greenfield investments in infrastructure are new developments where no previous facilities exist. Being riskier, investors should target higher returns for greenfield investments, although they may find themselves in competition with construction contractors that may be prepared to accept lower equity returns as a means of securing lucrative construction (and sometimes operating) contracts. Brownfield investments, in contrast, are investments in facilities that already exist, although they may require additional capital for upgrading or expansion. They typically include a current cash flow component from the currently operating facilities, which, together with some operating and usage history, makes them less risky. Depending on circumstances, both can be considered as development stage infrastructure.

Completed assets may represent growth opportunities, either because operations have only recently begun or because historically they have been managed sub-optimally. Alternatively, assets may be well established with more limited growth, e.g., they are mature or in “steady state.”

The risk and return profile of an infrastructure project, whether it is greenfield, brownfield, in growth phase or mature (with no significant capital expenditure needed), varies greatly and this is manifested through its several stages. For instance, early stage projects face construction, demand, regulatory, public acceptance and project financing risks. Value creation for these projects with greenfield risks stems from asset value growth or from opportunities to refinance at lower interest rates. These attributes are summarized in Figure 2.

FIGURE 2: Stage-wise Potential Return and Risk Profiles in a Stylized Form



Source: CAI Research for illustrative purposes only.

Geographic Scope

Infrastructure funds may specialize in certain geographies. Different geographies may provide different returns during the economic cycle to the extent that the timing and amplitude of economic cycles varies between regions and countries. Global infrastructure portfolios including emerging market investments generally provide opportunities to achieve higher returns to compensate for the inherent higher risks in emerging markets. Whether these additional returns will be sufficient compensation for the added risk, particularly as emerging markets become more competitive, is debatable. There are also funds that invest in developed countries only (variously defined as OECD, investment grade countries or Europe plus North America and Australasia).

Some managers have elected to raise a number of regional funds instead of a single global fund and there are also local fund managers offering regional or country-specific funds. These managers may be able to offer better local knowledge and government relationships. However, they have to invest in a more constrained opportunity universe, which may lead them to be less selective if they struggle to invest their funds.

Sector Scope

Most infrastructure funds target a range of infrastructure sectors, largely consistent with the set described previously in this article, potentially with a preference for economic infrastructure. However, there are also funds that specialize in utilities or transportation such as water, roads or airports. Specialist sector funds have similar advantages and disadvantages to geographical specialists: potentially more specific sector knowledge but a more limited universe of opportunity.

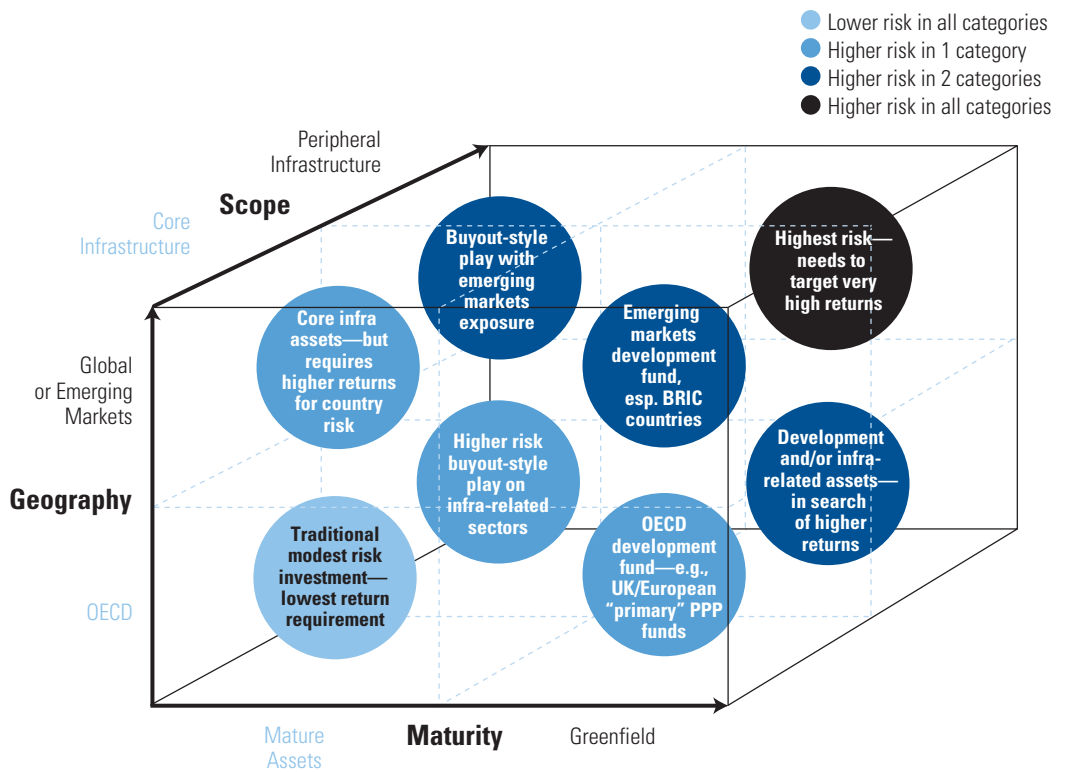
One area that has a large number of sector specialist funds is social infrastructure/PPPs. In particular, there are a number of well-established fund managers in the U.K. that specialize in "Private Finance Initiative" projects (also known as "PFI," a form of PPP used in the U.K.). The majority of PFI projects are for accommodation-type facilities. They do not feature demand risk and other risks that are passed through to construction and service contractors. Consequently, equity in PFI projects is particularly low risk, even for infrastructure, and so returns are often at the lower end of the range (potentially single digit IRRs).

This area is one of the most established areas of financial investor involvement in infrastructure and has become very competitive, resulting in a further reduction in returns available in recent years.

Core Infrastructure and Peripheral Infrastructure

A more recent development in the infrastructure fund space is the emergence of funds with relatively wide investment criteria. These funds invest in core infrastructure and in more peripheral assets that do not perfectly fit the description presented on page 2. For example, some infrastructure funds have invested in logistics and support services companies, which may benefit from the global supply/demand imbalance for infrastructure but do not have such high barriers to entry and revenue assurance. Consequently these assets bear more risk and should offer higher returns to compensate. This strategy may appeal to investors seeking a more buyout-style risk/return profile. Fund investing strategies are depicted in Figure 3.

FIGURE 3: Spectrum of Infrastructure Funds



Source: CAI Research.

Comparing Infrastructure Investments with Other Assets

Infrastructure investment encompasses multiple sectors, geographies, stages, and investment instruments/products each with their own risk/return attributes. This broad range makes it a versatile asset permitting its consideration in diverse tailored portfolios. Infrastructure's capital gain potential can be viewed as an equity option attached to its bond-like steady predictable return—together not unlike a convertible bond. While infrastructure has been compared to core real estate and to private equity buyouts it is arguably more appropriately viewed as a distinct asset class of its own.

Bonds vs. Infrastructure: Infrastructure funds provide cash flow streams analogous to coupon payments from bonds. Since infrastructure projects are heavily debt financed, an increase in interest rates may result in higher debt financing costs that reduce earnings and distributions. In this regard they are adversely affected, much as bonds are, by increases in interest rates (although inflation correlation in infrastructure provides some insulation from nominal interest rate changes). However, unlike long-only bond portfolios, infrastructure project financing tends to be interest rate hedged thereby mitigating the impact of an interest rate increase. In addition, these securities are generally not callable and hence, are less negatively convex.

Real Estate vs. Infrastructure: Infrastructure is sometimes viewed as a close proxy, though certainly not a perfect substitute, for real estate assets. The stable cash flows generated by mature infrastructure assets, such as electricity transmission cables, roads, and oil pipelines have some similarities to the rental income streams in core real estate. However, infrastructure businesses typically feature more potential for upside and downside variation than the fixed rentals in real estate. Conversely, infrastructure greenfield projects, such as constructing new power plants, new airports or maritime facilities, have a distinct developmental component that bears some analogy to opportunistic real estate. At the development stage, real estate can often be more risky than infrastructure, depending on asset-specific risks and the degree of mitigation. However, the differences from real estate, enumerated in Table 5 on the following page, are often missed. Not surprisingly, publicly-traded, pure-play infrastructure assets have tended to be undervalued compared to REITs and real estate operating companies. This differential is expected to decline as infrastructure is better understood as an investment category.

Buyouts vs. Infrastructure: Private equity buyout funds generate returns by enhancing underlying portfolio asset values by employing innovative financing terms, management changes, financial engineering, and improvements in operating efficiency. While many of these features, such as operational improvement and optimization of capital structure, are common to buyouts and infrastructure, traditional buyouts typically involve more radical changes to their target businesses in order to generate value.

Buyout funds tend to make most of their returns from capital gains generated by changes to their portfolio companies and exit within four to six years. Infrastructure funds, in contrast, are long-term oriented, catering to investors that seek exposure to the underlying portfolio for 20 or 30 years, or even indefinitely. Value is generated from annual income and through incremental operational improvements. For funds that specialize in development stage assets, sale at enhanced valuations reflects reduced risk upon construction completion.

Equities vs. Infrastructure: The performance of private infrastructure assets is less influenced by fluctuating demand and market cycles than equity investments in elastic goods. Therefore, they tend to exhibit low beta to the overall equity markets and their returns are weakly correlated with those of general equities.

TABLE 5: Comparison of Private Infrastructure in Developed Countries with Other Asset Classes

		Private Infrastructure	Bonds	Private Equity Buyouts	Core Real Estate
Returns ¹³	Returns expected by investors	Low to mid teens (gross) IRR depending on type of fund; higher for development stage	5% to 7%	High teens IRR	Around 8%
	Major source of returns	Periodic stable cash flows	Periodic coupon cash flows	Capital gains	Periodic cash flows and modest capital appreciation
	Effect of asset value growth	Modestly positive	Neutral	Strongly positive	Positive as residual value increases
	Effect of volatility	Low; appraisal based	Higher; market value based	Higher; appraisal based	Modest; appraisal based
	Opportunity for active management	High in early stages; more modest in highly regulated mature assets	Very limited; equity holders appropriate upside in a firm	High	Modest
Horizon	Fund life	10 to 15 years	Varies	10 years	10 years
	Life of underlying holdings before ownership change	20 to 30 years; funds may distribute asset interests in kind at maturity rather than sell the assets	Life of debt	3 to 7 years	3 to 7 Years
Acquisition Valuation		Conservatively discounted cash flow; PPP process/tenders	Discounted cash flow; efficient public markets	Multiples driven; typically high; buyout; trade sale	Cap rate (NOI/Price) driven
Fund Size		> \$300 million up to billions	Varies	> \$100 million	> \$100 million
Initial Investment		Very high capital expenditure; > \$100 million	Cost of bond	High	Medium
Operating Costs		Typically low	Not applicable	High	Low; for maintenance
Leverage		High; 60% to 75% of project finance as debt is common; can be up to 90% for PPP	Not applicable	Industry and sector specific	~30%
Liquidity		Low	High	Low	Low
Economic Drivers	Inflation	Typically hedged as inflation linked cash flows	Negative	Negative	Negative
	GDP growth	Positive	Neutral	Strong positive	Positive
	Interest rate increase	Modestly negative/neutral; often fixed rate long-term debt; inflation correlation partially hedges nominal interest rates	Strongly negative; duration and convexity dependent	Strongly negative as weighted average cost of capital increases	Negative as financing costs increase
	Regulatory changes	High impact	Neutral	Depends on indirect effect	Modest
	Demand changes	Demand stable	Neutral	High impact	High impact

Source: CAI Research.

¹³ CAI estimates only. Past performance is not indicative of future performance.

Private Public Partnerships

PPPs are collaborations between public bodies, governments and the private sector. They extend across a variety of sectors. These sectors can include transportation, water supply, waste management, the building and managing of hospitals, schools, public housing and prisons. PPPs can take a wide variety of forms with varying involvement of the private sector and with varying degree of risk transfer from government to the private sector.

PPPs and regulated assets (as in economic regulation with the regulator setting prices) are normally mutually exclusive. A PPP is a finite concession with some price mechanism agreed to contractually up front. Privatized assets are owned by the private sector under a license and prices are periodically set (or at least reviewed) by a regulator to ensure they are appropriate and fair to the owner and to customers.

Regulation and Public Policy

Governments have long recognized that investments in infrastructure produce positive externalities, contribute to economic growth, expand market access and reduce inefficiencies. From a public policy perspective, improvements in regulation, governance, transparency, ethics, property rights and external checks are necessary and go a long way in encouraging private sector participation in infrastructure projects. Ideally, regulatory public policy with respect to PPPs would be consistent with technological innovation, capital needs, market developments, public opinion and changing needs to create a balance between the multiple and often opposing constituencies. Issues that inevitably feature in policy discussions relate to economic transfers and distributional effects, e.g., who benefits and at what costs to others, rents, accountability, regional development, jobs, prices and tariffs.

Given the extremely high upfront capital costs in establishing projects, infrastructure assets exhibit natural monopoly characteristics; often a single firm can produce essential social services outputs at greater efficiencies and at lower social costs than multiple competitive firms. Recognizing this, governments restrict competition and create statutory monopolies. To preclude excess rent seeking monopolist behavior, infrastructure services may be procured under PPP with an agreed pricing mechanism, or may be heavily regulated. In some cases, regulation has not kept pace with the swift pace of innovation in this arena.

PPP Development

North America

In the U.S., collaboration between the public and private sectors dates back to the building of the railroad system in the late 1800s and the federal highway system in the mid-1900s. However, PPPs in their present form have only been well documented since the late 1980s with a major growth spurt in 1998 following Congressional enactment of legislation to facilitate such formalized partnerships. To date, these partnerships have evolved from traditional procurement activities to providing a greater role for the private sector to design, build, operate and maintain turnkey infrastructure projects; roads and airports typically take this form.

Favorable legislation allowing for PPP type activities now exists in approximately 25 states though regulations vary materially from state to state. A congressional bill to establish a National Commission on infrastructure in the U.S. is being debated to ensure that it “meets current and future demand and facilitates economic growth.”¹⁴ Hopefully, it will progress towards addressing the thus far fairly ad hoc manner of PPP development in the U.S., specifically with respect to developing and adopting consistent, uniform standards in contract specifications, terms and concession awards. In this regard, borrowing from successful practices in the U.K. and Australia can result in centrally coordinated nodal agencies that aim to streamline the process by which regulation and legislation interacts with PPP initiatives.

¹⁴ National Infrastructure Improvement Act of 2006, bill S. 2388, 109th Congress.

The Canadian provinces of British Columbia, Ontario and Quebec have been active in establishing programs to encourage PPPs in the transport and social infrastructure areas. The degree of commitment to infrastructure in Canada is highlighted when one notes that the province of Ontario's Ministry of Public Infrastructure Renewal projected that 20% to 25% of the province's infrastructure investment plan "will come from alternative financing and procurement arrangements in order to take advantage of private sector capital, expertise and efficiencies."¹⁵ Over 20 PPP transactions have closed in recent years with a strong pipeline behind them. The beneficial impact on their budgets has been well noted. Several Canadian pension funds have been fueling this trend by making greater dedicated portfolio allocations to infrastructure.

Infrastructure Canada, a government department, is responsible for coordinating and supporting infrastructure partnerships across the country reflecting the Canadian government's concerted drive to identify opportunities and execute PPPs at the federal level. The federal government has recently set up a C\$25 million national fund to encourage and develop PPPs.¹⁶ In addition to private funds, Canada has a number of public infrastructure funds and agencies such as the Municipal Rural Infrastructure Fund, the Canada Strategic Infrastructure Fund, Border Infrastructure Fund and the Infrastructure Canada Program.

U.K. and Western Europe

It is estimated that over €100 billion of PPPs have already been entered into in U.K., Italy, Spain, Portugal and France. The U.K. started off the current global trend towards privatization when it privatized its water, electricity, gas and airports beginning in the 1980s. Private Finance Initiatives ("PFI") structures were first formed in the U.K. in the early 1990s.¹⁷ They have come a long way since then and the U.K. now has one of the world's most developed markets for PPPs. Over 700 projects adding up to about £50 billion have been contracted for with over 400 projects already constructed.¹⁸ This activity is growing at a healthy rate of £10 billion a year. Leverage levels in PFI can be upwards of 90% debt with bank financing constituting around 70% of projects and the balance being provided by long-term bonds, historically supported by monoline wraps. The market for U.K. PFI project equity is probably the most mature infrastructure equity market in the world, with a number of specialist primary (construction phase) and secondary (mature assets) funds.

PPPs in Germany have received negative publicity¹⁹ largely because of the opposition to a national system for a global satellite positioning based toll collection from trucks on German motorways. This aside, Germany has a €488 million PPP to operate military helicopter training centers in place.²⁰ Recently, five highway expansion projects have also been tendered. In the Netherlands, muted activity in PPPs has been attributed to a lack of clarity in the potential benefits of private financings. A wastewater treatment plant stands out as a notable exception and activity is expected to pick up in the years ahead with new laws requiring mandatory PPP value assessment for large government projects. French PPP activity is expected to gain over the next few years with a new legislation called *Contrat de Partenariat* coming into effect.

Spain has led continental Europe in PPPs for road construction and management. Recently enacted legislation allows for creating concession-based projects in hospitals and for federal building construction. A broad based transport infrastructure plan called, *Plan Estratégico de Infraestructuras Transporte* ("PEIT"), provides for a €241 billion outlay for railways and roads.²¹ However, private financing for PFI contribution to roads and railways is expected to be modest; it remains designated largely to airports and ports. In Italy, however, PPPs and private financing in infrastructure projects for roads and railways is a relatively new phenomenon.

¹⁵ Ontario, Ministry of Public Infrastructure Renewal. <http://www.pir.gov.on.ca>.

¹⁶ Canada, Ministry of Finance, Budget 2007; Chapter 5. <http://www.budget.gc.ca/2007/bp/bpc5be.html>.

¹⁷ Australian PPPs developed about the same time but arguably U.K. was more influential given the larger size of the economy.

¹⁸ Euro PPP and Master PPPlan C.R.E.A.M. <http://www.cream-europe.eu>.

¹⁹ As a general trend, political will and financial necessity support the case for PPP all over Europe. However, when there is resistance from labor groups, some electorates have resisted PPPs.

²⁰ Deutsches Institut für Urbanistik. <http://www.difu.de>.

²¹ Strategic Infrastructure & Transport Plan. Ministerio De Fomento, PEIT. http://www.fomento.es/MFOM/LANG_EN/default.htm.

A recent change in the legal framework also provides for PPP scope in hospitals and healthcare, parking lots and sport complexes. A dedicated government body called Infrastructure Spa manages key funding initiatives for railway networks, transportation and water facilities. Government has also charged a former state entity, *Casa Depositi Prestiti*, to lead the way for developing infrastructure projects at the provincial level as well as coordinate with the European Investment Bank for large joint projects. Portugal witnessed material developments in PPPs over the past four years after enabling legislation was passed to encourage greater coordinated private sector participation in roads and healthcare. About 17 to 20 long-term shadow toll road concessions have been developed over the past decade in Portugal, in which the government pays the concessionaire the tolls that would otherwise have been paid for through usage fees by automobile drivers.

Australia

As mentioned earlier, Australia has been a pioneer in developing PPPs and expanding access to private infrastructure funds. Its speed in moving from a standing start in 1993 to an almost complete transformation in 1998 is astounding with continuation of well thought out government policy over the past decade. Given very low domestic savings rates in the 1990s, government intervened to encourage private savings in pension assets and enacted favorable legislation creating the impetus for pension plans to invest in infrastructure. This led to the formation of dedicated pension plan funded private and public infrastructure funds.

Australian concessions began with toll roads and airports and steadily expanded to electricity, gas transmission and distribution systems as well as PPPs. Australian investors initially invested in the domestic market and, as it grew, began to make considerable global strides.

In Australia, there are about 2,000 privately owned infrastructure assets with value exceeding A\$90 billion. There remains considerable potential for this to grow. Australia's infrastructure deficit is estimated at A\$20 billion and climbing.²² The Business Council of Australia estimates that in order to sustain continued growth in Australia, A\$120 billion will be needed in infrastructure expenditure in the next 20 years in the areas of rail, road, water and energy alone. However, the market is extremely competitive.

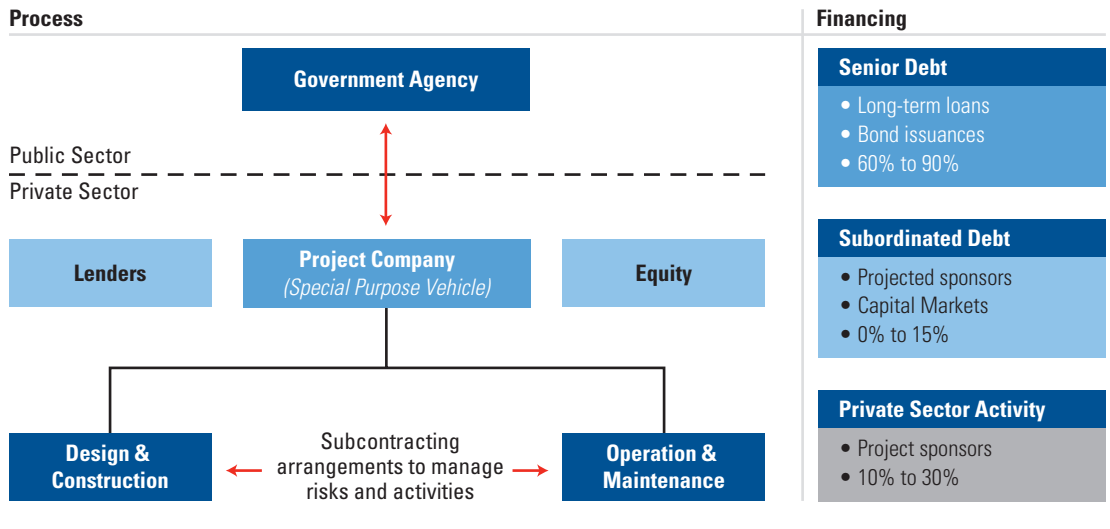
PPP Organization and Funding Structures

In order to enter into a PPP contract to design, build, operate and own an infrastructure asset, under a long-term government concession, the private sector investors form a special purpose vehicle ("SPV") to act as concessionaire. Based on the concession contract and projected revenues from usage fees, the SPV receives equity capital from investors and enters into a contract with a design and construction company to build the asset. It may also enter into a separate contract with an operating company for the operation and maintenance of the infrastructure asset (see Figure 4).²³

²² Consolidated from <http://www.infrastructurereportcard.org.au/>.

²³ The structure in Figure 4, represents a PFI and, in principle, also applies to the several variations of PPPs found across countries.

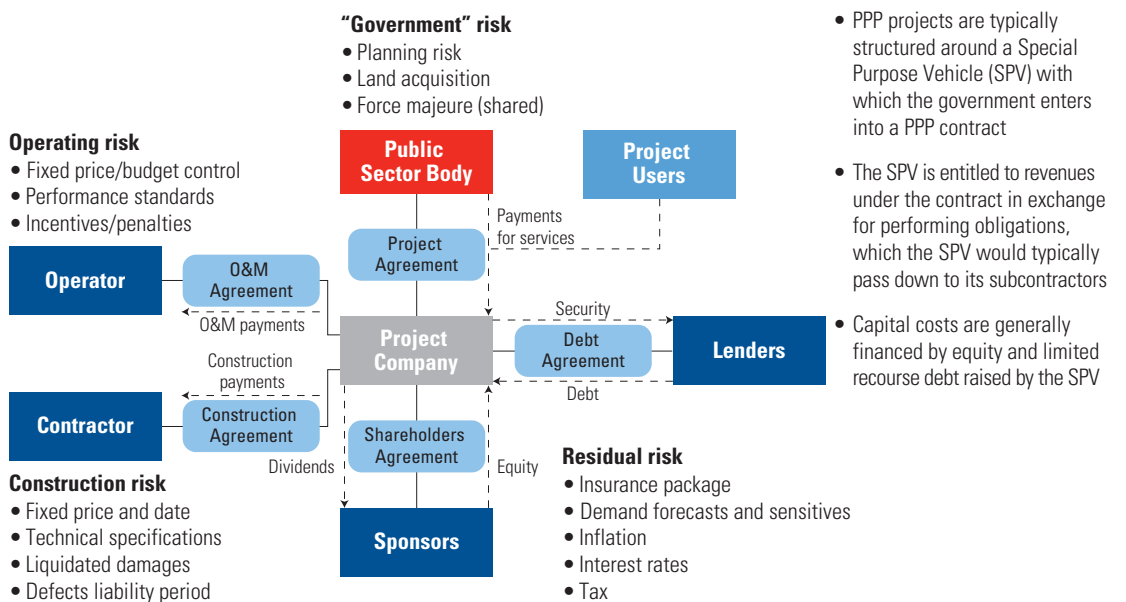
FIGURE 4: Example of a Structure of a Private Public Partnership



Source: CAI Research.

The SPV also raises debt that can range from 60% to 90% of the total project costs. Upon completion and commissioning of the infrastructure asset, the revenue generated through usage fees after payment of the concessionaire at the agreed upon tariff rate is used to partly pay down debt with the surplus passed on to equity contributors. An example of the commercial structure of a PPP is illustrated in Figure 5.

FIGURE 5: PPP Contractual Structure



Source: CAI Research.

PPP and PFI participation in both the development of new greenfield projects and the development of existing public sector assets affords several benefits. In addition to providing new sources to finance capital-intensive projects, competition improves the supply and quality of infrastructure services by applying private sector management skills, technical expertise and efficiencies. Properly implemented, PPPs and PFIs transfer risk from the public sector to entities that may be better qualified to bear it as well as be better qualified to reduce costs and create better service delivery outcomes. It also frees government resources and public funds to address pressing social problems or to develop projects that are less attractive to private investors.

Competition for choice infrastructure assets remains considerable. Success for the qualifying bidder is conditioned, among other things, on the bidder's reputation and demonstrable ability to successfully execute the functions pertinent to the specific asset. These functions are dependent on the specifics of the stage of asset and may be design, development, construction, financing, operating or maintenance.

PPPs and PFIs, as with privatizations, have faced their share of opposition from advocacy groups and, sometimes, the public. Criticism is often directed at allegations of reduced accountability and the profit motive of the private sector, which may be at odds with the public interest. This criticism tends to be more intense in projects where fees charged to the public are highly visible, such as in the case of toll roads. There have also been instances (although rare) of privatization reversals in response to allegations of underinvestment and poor asset upkeep.²⁴ Many issues are driven by public perceptions. For example, municipalities may be reticent to declare future toll increases and may have minimal incentives to publish aggressive projections for these can be politically unpalatable. Private concessionaires, on the other hand, are less reluctant to establish explicit future increases. Unlike municipal entities that borrow to meet a set capital need and thereby defer the debt problem to be addressed at a later time, private parties strive to optimize capital structures and maximize an internal rate of return. On balance, however, the vital role of PPPs and PFIs is being increasingly recognized. We believe that with government agencies strapped for financial resources, PPPs and PFIs are indeed poised to increase in importance over the coming years.

Geographic Review and Sector Opportunities

As discussed before, infrastructure markets differ by country and region and are at various stages of maturity. The scope for private sector involvement depends on the history, regulatory regime, property rights system, the state of capital markets and macro-economic outlook. Not surprisingly, therefore, infrastructure investing has a strong local element. We begin with the North American market as it represents an extensive investing opportunity set and selectively touch upon a few sectors with scope for private investment. Western Europe is briefly discussed next.

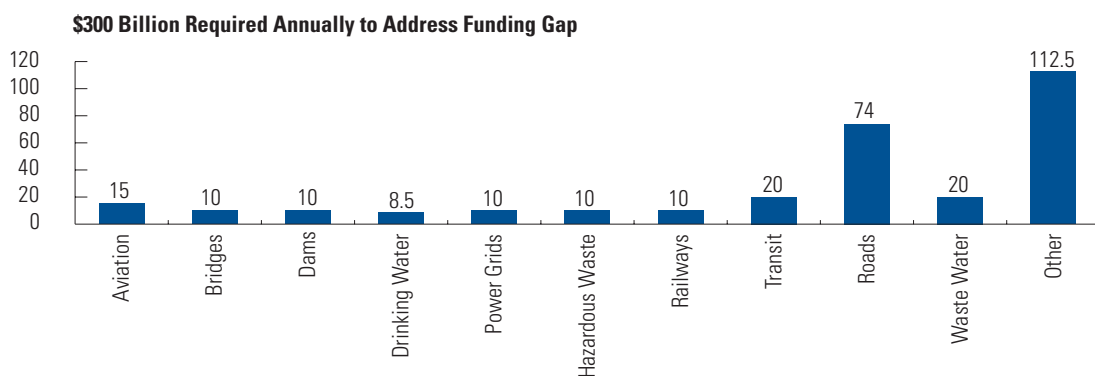
North America

Infrastructure Demand: Overview

The North American infrastructure sector is growing significantly, reflecting the size and maturity of the region's economies. Together, the U.S. and Canada account for approximately 30% of global GDP. Their extensive transportation and utility networks as well as other infrastructure assets add up to several trillions of dollars. In the U.S., the market for private investments in existing or new infrastructure assets via PPPs is still relatively immature as compared to private equity and venture capital investments. However, the U.S. market is growing steadily with the formation of dedicated infrastructure funds. In addition to the funding gap of \$300 billion estimated by ASCE (footnote 5 and Figure 6) is the trend of municipalities to "harvest non-core assets" and apply the resulting proceeds to new infrastructure projects.

²⁴ "New Zealand reversing privatization of rail and ferry system for NZ\$665M," *The Associated Press*, May 5, 2008.

FIGURE 6: U.S. Infrastructure Annual Funding Gap



Other: Schools, Solid Waste, Navigable Waterways, Parks, etc.

Source: CAI Research based on ASCE numbers.

The compelling risk return attributes of these assets combined with the current low interest rate environment are a strong contributor to this growth by enabling private financing at levels that compare favorably, or at least not at a meaningful disadvantage, with U.S. tax-exempt municipal financing.

We estimate Canada's infrastructure funding gap to be between C\$50 billion to C\$125 billion per year. An inter-government agency estimates needs of C\$23 billion over the next few years in Canada's urban transit, and around C\$66 to C\$97 billion over 10 years for urban roads and bridges alone.²⁵ Canada's provincial and local governments face an estimated C\$44 to C\$60 billion infrastructure deficit, "tens of billions" for water treatment and over C\$13 billion to overhaul mass transit.²⁶

Transaction Types

Ownership structures vary by infrastructure sub-sector, with some areas such as roads and airports almost completely government-owned and operated, and others, such as electricity and natural gas, dominated by private investors. As in other regions, transaction opportunities are generally of two types: first, acquisitions of assets from other private sector entities called private-to-private transactions, and second, investments in assets previously owned by governments (full privatizations or concessions). Both of these are expected to increase.

The usual reasons that motivate mergers, acquisitions and divestitures of transactions of corporate assets or businesses also apply to private to private transactions of infrastructure assets. In addition, regulatory easing and incentives for capital investing as well as tax changes (e.g., announced changes to tax treatment of Canadian income trusts) also contribute to private to private transactions of infrastructure assets by altering the after-tax cost of capital of some entities and thereby causing differential valuation of a given asset by the advantaged entity. As to PPP transactions, foreign investors including those originating from Australia and Spain, have lately been acquiring infrastructure assets and concessions in the U.S. at noticeable premiums to local bids.²⁷

²⁵ "Looking to the Future: A Plan for Investing in Canada's Transportation System," The Council of the Federation, December 2005. See also reports from the Federation of Canadian Municipalities and the Association of Consulting Engineers of Canada.

²⁶ Townson, M. "The Role of Pension Funds in Financing Investment in Public Infrastructure," Commissioned by the Canadian Union of Public Employees, October 2003.

²⁷ One could speculate that the premium reflects the funds' experience and efficacy in the area, a deliberate penetration strategy into a likely lucrative market for the coming years in a country with minimal country risk and future favorable regulatory environment for long-term infrastructure investing.

Next, we discuss the opportunities in each sub-sector.

North America Infrastructure Sub-sectors

Transportation

Transportation services in 2004 in the U.S. were estimated at \$319 billion accounting for approximately 3% of GDP.²⁸ Some drivers of demand, and therefore, opportunities for private investment are:

(i) Substantial growth in the value of goods transported: The value of goods transported via domestic freight transportation is expected to grow threefold from 1998 to 2020. International shipments are expected to increase fourfold over this same period.²⁹

(ii) Pricing improvements: Growing demand for seamless, more efficient and faster delivery of high value transportation products has resulted in increased pricing flexibility for transport service providers.

Airports

U.S. airports, in almost all cases, are owned by local, state, or regional governments or their designated public bodies. To date, authorization has been given for five airports³⁰ to be privatized, including one major hub airport. An estimated \$39.5 billion³¹ will be needed over the next five years to meet the infrastructure demands of all segments of civil aviation, e.g., the 510 U.S. airports with commercial service.³² This is in addition to new security costs that are expected to total roughly \$4 billion to \$5 billion;³³ however, it is not uncommon to significantly under-estimate these costs. This compares to the average annual capital funding available to airports of approximately \$12 billion, according to a dated estimate.³⁴ Not surprisingly, there is increasing uncertainty as to whether public sources of airport funding will be sufficient to meet future capital expenditure needs. Private investments are therefore a natural consideration.

The privately run airport model has also derived backing from its successful experience in private airport operations outside of North America. There is an increased recognition in many quarters that North American airports may be less efficient than privately operated airports in other parts of the world.³⁵

Bridges, Roads and Transit

The majority of roads, bridges and tunnels are held by states and counties, whether directly or through their departments of transportation, mobility agencies, or turnpike commissions. Though a handful of toll roads have recently been transferred to the private sector via long-term concessions or leases, ownership of the sector remains largely with state entities. Around \$59.4 billion is being spent annually, which is well below the \$74 billion³⁶ needed each year to improve transportation infrastructure conditions nationally. It will cost \$9.4 billion³⁷ a year for 20 years to eliminate all bridge deficiencies alone. With increasing global and national commerce, the value of goods transported via domestic and international freight transportation is expected to continue to grow.

²⁸ "Transportation Statistics Annual Report," U.S. Department of Transportation Bureau of Transportation Statistics, December 2006.

²⁹ "Federal Highway Administration, Freight Analysis Framework, #1," U.S. Department of Transportation, October 2002.

³⁰ Federal Aviation Administration. http://www.faa.gov/airports_airtraffic/airports/airport_obligations/privatization/.

³¹ Federal Aviation Administration. http://www.faa.gov/airports_airtraffic/airports/planning_capacity/npias/.

³² *Ibid.*, footnote 5.

³³ "Views and Estimates of the Committee on Transportation and Infrastructure for FY 2005," U.S. House of Representatives.

³⁴ Statement of James C. May President and CEO Air Transport Association of America, Inc. before the Subcommittee on Aviation Committee on Transportation and Infrastructure United States House of Representatives March 12, 2003.

³⁵ It should be noted in passing that there are likely to be meaningful investment opportunities surrounding airport services such as car parking, retail, fueling, ground handling and security.

³⁶ *Ibid.*, footnote 5.

³⁷ *Ibid.*, footnote 5.

The U.S. and Canada contain over 8 million and 1.3 million lane-miles of roads respectively.³⁸ U.S. lane-miles have increased approximately 5% since 1980 while vehicle-miles traveled have increased nearly 100% over the same period.³⁹ Consequent congestion is increasingly negatively impacting economic growth. The increase in truck traffic generated by higher international trade in recent years has placed particular demands on road infrastructure. States have begun to recognize the historical under-investment, as well as the latent value in their existing transportation assets and are encouraging broader private participation in the road sector. A handful of recent PPP transactions have allowed governments to monetize the value of these assets and make marked improvements in their budgets. As a result, there is a growing scope of opportunities in the road sector of the greenfield and the brownfield variety.

Railways

North American railroads operate over an interconnected network of approximately 170,000 route-miles throughout the U.S. and Canada.⁴⁰ U.S. railroads move approximately 42% of freight, including bulk commodities and intermodal⁴¹ cargo, which includes containers and truck trailers.⁴² Recent years have seen rapid growth in intermodal traffic, which has more than tripled in the U.S. between 1980 and 2005, rising from 3.1 million to 11.7 million containers and trailers.⁴³ In 2005, intermodal loadings grew 6.4% in the U.S. and 4% in Canada, compared with commodity loadings growth of 0.9% in the U.S. and 0.4% in Canada.⁴⁴ Increased traffic over the last decade has resulted in service and capacity constraints on certain rail corridors. Freight transportation demand is expected to continue to grow; the U.S. Department of Transportation forecasts a 55% increase between 2000 and 2020.⁴⁵

Given the capacity constraints of freight railroads, there is a pressing need for investment in intermodal terminals, additional track capacity for ports, and long-haul corridor upgrades on bridges and tunnels to accommodate double stacked trains. The railroad industry alone needs to spend over \$12 to \$13 billion per year to maintain existing infrastructure at a cumulative cost of approximately \$175 billion to \$195 billion over the next 20 years.⁴⁶ In addition, if an intercity corridor passenger rail service were developed, that alone would cost an estimated \$60 billion over 20 years.⁴⁷

PPPs have begun to develop ports, municipalities and railroads. As the market evolves new opportunities are expected to open in rail infrastructure investing such as those for terminals, storage and other rail facilities. These facilities may be located at seaports, inland ports, and at inland rail hubs. Smaller railroads also present attractive investment opportunities. Short line railroads, especially in the western U.S., are expected to experience faster growth in coal volumes following U.S. coal production trends. Additional consolidation within the regional/short-line market and opportunities to organically grow and leverage existing operations is possible.

Maritime Ports

North American ports utilization has increased rapidly over the past decades due to an expansion of international trade. Containerized cargo transported through U.S. and Canadian ports grew at 7.1% annually, reaching 44 million twenty-foot equivalents units ("TEUs") over the decade ending in 2005.⁴⁸

³⁸ "Highway Statistics," 2004, Table HM-10, U.S. Department of Transportation Federal Highway Administration; "Transportation in Canada," 2005, Transport Canada.

³⁹ *Ibid.*, footnote 25.

⁴⁰ "Overview of U.S. Freight Railroads," Association of American Railroads, October 2006.

⁴¹ Intermodal transport is the transportation of goods carried within containers over multiple modes such as trains, roads and ships.

⁴² "Overview of U.S. Freight Railroads," <http://nationalatlas.gov/index.html>.

⁴³ "Rail Intermodal Transportation," Association of American Railroads, January 2006.

⁴⁴ "Railway Trends 2006," The Railway Association of Canada, December 2006; "Class I Railroad Statistics," Association of American Railroads, November 2006.

⁴⁵ "Freight Railroad Capacity Issues," Association of American Railroads, September 2006.

⁴⁶ *Ibid.*, footnote 5.

⁴⁷ *Ibid.*, footnote 5.

⁴⁸ "Containerport Markets in the Americas to 2020," Ocean Shipping Consultants.

Volume is expected to grow at 6.1% in the coming years, reaching 80 million TEUs by 2015. Growth of other types of cargo is also strong, but less so than that in containerized volumes as there continues to be some shift of cargo from bulk to containerized format. Capacity, however, is expected to grow at only 4.6% over the next ten years, reaching 88 million TEUs in 2015, indicating capacity utilization of approximately 90%. Capacities can be increased by improving efficiency at existing terminals or by developing terminals. Terminal development is ultimately limited by the availability of appropriate waterfront land and related environmental, zoning, and other regulations. Improving the efficiency of existing terminals and building new facilities require significant capital investment that provides further scope for private investment.

We believe that PPPs for developing new terminals are inevitable as world trade growth continues. For instance, cities with waterfront land and deep water channels may seek to develop port capacity to capture the revenue that marine ports can provide. The majority of private sector ports operators in North America have changed hands in the last few years.

Inland Waterways

The ASCE estimates the cost to replace the present system of locks at more than \$125 billion.⁴⁹

Water

Infrastructure assets in this sector include water utilities, waste water utilities and related treatment and services businesses. Obviously, water is vital and water infrastructure essential, yet in many U.S. cities water infrastructure is 80 to 100 years old. Urban and suburban population growth and migration to regions which lack sufficient infrastructure to cope with newcomers are making things worse. According to the Environmental Protection Agency, approximately \$277 billion must be spent during the 2002 to 2022 timeframe to upgrade the water and waste water infrastructure in the U.S.⁵⁰ ASCE estimates an \$11 billion annual shortfall.⁵¹

Water, as an infrastructure sector, is notable for being highly fragmented, capital constrained and uncompetitive. We estimate that approximately 85% of the U.S. water and waste water infrastructure is owned by governmental units. In the U.S. there are approximately 48,900 municipal water utilities that serve fewer than 10,000 customers each. Many of these municipal water systems are unable to provide the necessary capital to upgrade their water and waste water systems and have difficulties complying with stringent EPA maintenance and water quality standards. Increasingly, these municipalities are turning to the private sector for solutions and capital. The ones in smaller cities and towns may outsource design, upgrades, construction, management and operations. This will further create attractive private investment opportunities in ancillary industries and businesses that provide these infrastructure support services.

European utility conglomerates have largely exited the U.S. water sector after experiencing limited success in navigating the local regulatory landscape. At the same time, given the disparate level of municipal ownership, there are relatively few large private domestic water companies.

Investment opportunities in this sector include purchasing private water operators, securing rights to water systems through long-term concessions or leases, or entering into operation and maintenance contracts for water systems that remain in public hands. Desalination facilities, water and waste water treatment facilities and water transportation infrastructure are additional assets that could prove attractive. Many of these assets carry a very high up-front capital cost and have a long payback period. Not surprisingly, due to the essentiality of water and the extreme need for new infrastructure, these assets typically enjoy very stable cash flows and water utilities typically have regulated returns.

⁴⁹ *Ibid.*, footnote 5.

⁵⁰ U.S. EPA, *Drinking Water Infrastructure Needs Survey & Assessment*, June 2005.

⁵¹ *Ibid.*, footnote 5.

Waste Management

The solid waste management industry includes collection, transfer and disposal services for commercial, industrial and residential customers. Landfill capacity is declining rapidly and it takes an average of approximately eight years to obtain a new landfill permit in the U.S. due to potential local community resistance. Waste incineration also faces significant environmental and regulatory hurdles. We estimate that the five largest waste management companies account for around half of the total market revenue. They also have vertically-integrated businesses that compete in many segments within the industry. Municipalities and small independent companies, competing primarily in the collection segment, make up the other half of the market. Meaningful opportunities (for example in resolving sludge and problematic waste streams issues) exist for vertically-integrated operators who have the capability to deploy substantial capital.

Overall, the need for waste disposal is rising while new capacity coming on stream is not keeping pace. The challenges of greenfield investment as well as for aggregation and roll up continue to remain considerable.

Power and Natural Gas

Investment in electricity generation and transmission has been declining in real terms for the past 20 years. About half of the nation's generation fleet is now more than 30 years old.⁵² The North American Electric Reliability Council highlights that electric capacity margins will continue to decline and the construction of new transmission lines will continue to face funding obstacles. The U.S. must add the equivalent of 400 new power plants and 100,000 miles of new transmission by 2020 to meet demand growth. That will cost about \$35 billion a year on average.⁵³ There is also considerable scope for new investments in natural gas distribution pipelines, storage and liquefied natural gas. The National Petroleum Council⁵⁴ estimates that \$9 billion a year will be required to fund pipelines, storage and distribution in North America.

Population growth combined with a significant increase in the quantity of gas-fired power generation assets has created a period of sustained demand for natural gas. This demand is likely to create significant opportunities for investment in new pipeline development, natural gas storage, other mid-stream assets and LNG facilities.

Power Generation

Until recently, the U.S. electricity generation sector had been highly regulated with rates set to cover operating costs and provide a fair return on equity. This, however, allowed utility companies to grow earnings by increasing their rate base, which encouraged capital expenditure but provided little incentive to operate efficiently. The Public Utility Regulatory Policies Act of 1978 and the Energy Policy Act of 1992 helped establish an unregulated "wholesale" power market in which electricity could be sold at market-based, rather than regulated, rates. These changes led both utilities and non-utility independent power producers to develop new merchant generating facilities to sell power into spot markets or under bilateral contracts. Additionally, available capacity margins, the difference between committed capacity resources and peak demand, are projected to drop below minimum regional target levels in most areas in the next two to three years. Development of renewable energy sources is also being encouraged by U.S. and Canadian governments who are offering cash incentives, accelerated depreciation and immediate expensing of development and start-up costs.

There is a considerable amount of ongoing private investment in power generation. While the need for additional capacity is undeniable, new projects in this space do face significant greenfield stage and rate risks. This sometimes dissuades certain types of investors from investing in this sector.

⁵² *The United States of America Federal Energy Regulatory Commission.*

⁵³ *Cambridge Energy Research Associates.* <http://www.cera.com>.

⁵⁴ *National Petroleum Council.* <http://www.npc.org/>.

Electricity Transmission

The U.S. and Canadian transmission grid consists of more than 200,000 miles of high-voltage cable with much of the existing infrastructure built between the 1950s and 1970s that is now reaching the end of its service life. Indeed, “normalized” transmission capacity, or the number of transmission line miles per unit of demand, declined by almost 19% between 1992 and 2002.⁵⁵ As a result, congestion has increased almost everywhere on the power grid, often requiring higher-cost generation to be dispatched in place of lower-cost resources and, in more extreme cases, causing shortages and supply interruptions.

The need to upgrade and strengthen the existing system creates significant investment opportunities. Long-distance transmission line projects are increasingly being required to connect remote base load and renewable electricity generation sources to the grid. Interest in developing large coal-fired and nuclear facilities has also increased. These facilities need new transmission lines for they are often located at considerable distance from load centers for environmental or fuel supply reasons. Renewable generation resources such as wind farms are also location specific. Recent regulatory changes make transmission opportunities particularly attractive for independent, non-utility investors that are not affiliated with power generation. The Energy Policy Act of 2005 included provisions that should facilitate and expedite development of new transmission projects, which includes increasing the Federal Energy Regulation Commission’s (“FERC”) authority to site transmission assets when state and local authorities fail to do so. It also introduced a variety of incentive-based rate structures. The regulated return available for developing or acquiring transmission assets and providing power transmission services can be higher than that available to utilities making this sector attractive for private investors.

Electricity Distribution

Electricity distribution is predominantly owned by investor-owned utilities, many of which are publicly traded. The resulting stable net cash flows are due to relatively steady, predictable usage patterns by broad bases of end users and limited exposure to commodity prices. Investment opportunities may be aided by the repeal of the Public Utilities Holding Company Act (“PUHCA”) in February 2006, which eased geographic restrictions on consolidation and allows new market entrants to invest more easily in the industry. Specifically, the repeal of PUHCA permits companies to acquire utility subsidiaries anywhere in the U.S. without “interconnection” or “same area or region” restrictions. This has further supported private investment in this sub-sector.

Natural Gas Transmission and Storage

Approximately \$60 billion of investment will be required to fund pipelines in the U.S and North America. Pipeline companies are constructing, planning and designing 40,210 miles of oil and gas pipelines. More than 88% of pipeline and 52% of compression capacity were installed before 1970 and are in need of replacement.⁵⁶ Adding to it are changes in usage patterns—declining stable industrial loads and increasing variable and weather-sensitive residential and commercial loads. Also increased demand from gas-fired electricity generation stations require more flexible natural gas transmission and storage systems.

FERC Order 636 in 1993 required interstate pipeline companies to unbundle their sales and transportation services. It also revised rate structures to allow for the recovery of most of their fixed costs through fixed demand charges. As a result, investments in gas pipelines typically offer highly predictable cash flows. Importantly, pipeline operators typically do not buy and sell the gas transported and hence are not vulnerable to commodity price risk. We believe that the pipeline sub-sector may generate substantial acquisition opportunities. As pipelines approach near full utilization capacity, they may be more valued by investor segments that have a greater interest in relatively stable, predictable cash flows than by owner companies that may target growth. Storage assets are another example of assets that offer stable cash flows. Though rates are not regulated here, capacity can often be sold forward under medium- to long-term contracts with reservation and usage components.

⁵⁵ “Why are Electricity Prices Rising?” The Edison Foundation/The Brattle Group. <http://www.edisonfoundation.net/reports.htm#prices>.

⁵⁶ Tubb, Rita, “Underground Construction.” http://goliath.ecnext.com/coms2/summary_0199-6214135_1TM.

Natural Gas Distribution

The North American natural gas distribution system is comprised of pipeline that receives gas from transmission pipelines and delivers it to end users. These pipelines are held by local distribution companies that are predominantly owned by investor-owned utilities. Gas distribution companies typically offer stable cash flows. They are usually permitted to charge rates that allow for the pass-through of natural gas and prudent operating expenses thus limiting exposure to commodity price volatility. Volume growth is stable albeit generally low. They also typically enjoy a monopoly position in their local markets, which underpins volume predictability. Like pipelines, these assets may be more highly valued by investors seeking relatively stable, predictable cash flows and thereby initiate ownership change transactions. Additionally, even though gas distribution companies' profitability is not generally directly affected by higher gas prices, higher prices do increase the credit requirements demanded by gas providers, which can raise the distributors' cost of financing or use up credit that the distributors may employ for other activities. This issue may prompt owners of gas distribution systems to consider selling assets creating private investment opportunities.

TABLE 6: Snapshot of Infrastructure Investment Needs for North America

Sector	Estimate	Source
All Sectors (U.S.)	\$300 billion per year; \$1.6 trillion over five years	American Society of Civil Engineers
All Sectors (Canada)	C\$50 billion – C\$125 billion per year	Canadian Government websites data aggregation
Transportation	\$319 billion in aggregate	Bureau of Transportation Statistics
Aviation	\$15 billion per year; 4.3% growth for seven years	American Society of Civil Engineers
Airports	\$39.5 billion over five years	Federal Aviation Administration
Airport Capital Development Costs	\$15 billion per year with \$5 billion per year for security	U.S. House of Representatives
Roads	\$74 billion per year	American Society of Civil Engineers
Bridges	\$9.4 billion year for 20 years	American Society of Civil Engineers
Railroad (Canada)	C\$13 billion per year and C\$190 billion over 20 years	Government of Alberta
Railroad (U.S.)	\$10 billion, 55% increase in traffic forecasted between 2000 to 2020; \$12 billion to \$13 billion annual	U.S. Department of Transportation
Seaports	4.6% growth expected over 10 years	American Society of Civil Engineers Ocean Shipping Consultants
Urban Transit (Canada)	\$23 billion	Federation of Canadian Municipalities
Urban Roads & Bridges (Canada)	\$66 billion to 97 billion over 10 years	Federation of Canadian Municipalities
Navigable Inland Waterways	\$125 billion	American Society of Civil Engineers
Transit	\$14.8 billion to \$20.6 billion	Federal Transit Administration
Dams	\$10 billion to repair critical dams over 12 years; around 3,500 unsafe dams	American Society of Civil Engineers
Drinking Water	\$11 billion	American Society of Civil Engineers
Waste Water	\$390 billion over 20 years	U.S. Environmental Protection Agency
Water and Waste Water Spending needed from 2002 to 2022	\$ 277 billion	U.S. Environmental Protection Agency
Power Grids	\$10 billion	American Society of Civil Engineers
Hazardous Waste	\$1.9 billion	American Society of Civil Engineers
Waste Management & Cleanup	\$148 billion to \$250 billion	U.S. Environmental Protection Agency
Energy Power Plants & New Transmission	400 power plants, 100,000 miles of transmission at \$35 billion per year	Cambridge Energy Research Associates
Pipelines, Storage & Distribution	\$9 billion	National Petroleum Council

Social Infrastructure

Social infrastructure assets, as we mentioned earlier, include public transport, schools, hospitals, convention centers, courthouses, police stations, prisons, and low cost, military or student accommodations projects. Canada has an active and rapidly growing social infrastructure PPP market. For example, in British Columbia, of the five projects in the procurement stage, four are for hospital or medical facilities; further, of the 13 projects either in construction or in operational stage, four are for medical facilities and one is for a sports center.⁵⁷ Like those in the U.K. and Australia, social infrastructure PPPs in Canada typically involves a significant development component.

In a social sector infrastructure project the private investor receives payments from a state entity for the set of services that it provides. These payments are steady with minimal credit risk. Core services continue to remain the responsibility of the public sector agency. For example, under a school PPP, teaching would be provided by the public education agency while development, operation and maintenance of the facility may be provided by the private sector entity. In the U.S., social infrastructure assets generally remain under public sector ownership and control, often through federal or state government agencies.

Western Europe

Largely as a result of PPP and PFI initiatives, investing opportunities in the Western European infrastructure market has grown significantly over the last decade, with growth especially pronounced over the last several years. Some factors driving the need for private investments in infrastructure in the region are:

- (i) Many EU governments have been looking to the private sector as they rein in public spending on costly infrastructure projects. This is due to slowing GDP growth rates, limitations on taxation and the need to conform to EU budget deficit limits.
- (ii) Recent entrants in the EU and EU accession countries are under strong pressure to undertake massive investments in infrastructure in order to meet EU directives in the water, sanitation and power sectors. They are expected to turn to the private sector for financing.
- (iii) EU competition laws dissuade monopolies and the potential for future forced breakups provide further privatization opportunities.⁵⁸
- (iv) PPP activity is gaining further traction with recent regulatory changes that permit PPP capital expenditure to be kept off government balance sheets. From an accounting perspective, this shields government outlays in a PPP from being reflected as a budget deficit.
- (v) Pension funds, insurance companies and institutional investors are making increased allocations to infrastructure investing.

We have already addressed Western European sector opportunities in a previous section on PPPs.⁵⁹ We briefly highlight overall trends in regulated utilities and the transportation sector next, for it is in these sectors that we expect much of the growth to happen.

Regulated Public Utilities

These are largely made up of network assets that allow the transmission, distribution and storage of electricity, gas, water and waste water to-and-from end customers. Businesses in this sector are typically monopolies for a defined geographic area of operation and are therefore regulated. Having once been or still being largely state owned (in some European countries the state or quasi-state or municipal-type bodies remain the owners of transmission and distribution networks) there have been varying degrees of regulation in each country.

⁵⁷ *Ibid.*, footnote 16.

⁵⁸ European Commission, Energy. http://ec.europa.eu/energy/index_en.html.

⁵⁹ See page 18, U.K. and Western Europe for sector opportunities.

EU directives to achieving broader uniformity are gradually taking shape. As a result, attitudes to asset ownership are also evolving and combined with public budget constraints, the opportunity for asset privatization continues.

An ongoing theme in Europe, supported by EU directives, is the progressive liberalization of the utility market place, with the aim of increasing competition between utilities thus stimulating greater choice and better deals for customers. To this end, the recent European Commission's "An Energy Policy for Europe" integrated energy package clearly demonstrates its desire for greater progress in competition. This is being catalyzed through greater separation of the network wires/pipes from upstream electricity-generation/gas-fields and downstream customer business functions ("unbundling"). This policy statement also affirms and accelerates the importance of renewable energy projects, allowing member countries to meet their Kyoto emission reduction targets. Both the unbundling of integrated energy suppliers and the focus on increased usage of renewable energy are expected to result in increased investment opportunities in the regulated utility sector.

Transportation

The level of regulatory control imposed on transportation operators varies in this region with airport and toll road operators more regulated than port operators. In many jurisdictions, the operation of transport infrastructure is on a concession basis, rather than full ownership transferring to the operator. Exogenous factors, such as the cost of fuel and congestion, also impact demand for transportation infrastructure services. Important trends in the transportation infrastructure sector over the near term include continued privatization/concession sales, and regulatory focus on transportation operations. Privatization or PPPs regarding French and German airports continues to be in focus. Finally, regulatory attention on operators with significant market power in the transportation sector, such as BAA in the U.K., could result in disposal of certain assets in their portfolios.

Conclusion

Infrastructure has traditionally been under the purview of governmental bodies. Its importance from a public interest perspective cannot be overstated. For several reasons, there has been globally widespread historical under-investment, resulting in degradation of existing assets with simultaneous failure to add new capacity. As this issue is unlikely to reverse course any time soon, forward thinking countries and government entities have sought to encourage convergence of public and private sector activity. Their aim is to help the creation of economically viable new infrastructure assets and upgrade, properly maintain, manage and operate existing ones.

Formal contracting structures through active PPPs supported by recent government initiatives have made progress in encouraging private capital investment in infrastructure. A lot still remains to be done. Despite where they stand in the different stages of the privatization process, the collective market opportunity in developed countries remains substantial. These opportunities are in civil aviation, bridges, roads, mass transit, railways, greenfield and brownfield projects, dams, water, waste management and energy.

Recent success of many new fund launches exclusively dedicated to infrastructure investing is suggestive of the vital role that private finance will continue to play in infrastructure development. This overall positive sentiment notwithstanding, a majority of institutional investors have yet to ramp up their investment capabilities in this area. Many of them have not made dedicated allocations to infrastructure, perhaps reflecting the relative infancy of this asset class. Consequently, early mover advantage possibilities remain both in developed countries⁶⁰ and, arguably even higher, elsewhere. Government policy, changing legislation and regulatory norms and private capital flows will strongly influence the evolution of infrastructure investments.

From an alternative investment perspective, infrastructure assets exhibit different risk and return profiles from other private investments; they can be a source of both alpha as well as a valuable diversification tool in portfolio construction. They provide exposure through both illiquid long-term private vehicles as well as liquid publicly traded funds. This versatility makes them extremely attractive for different investor segments.

⁶⁰ "Singapore's GIC invests \$400 million in U.S. energy infrastructure company AEI," *Thompson Financial*, May 13, 2008.

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