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Private sector participation in public sector financing

An introduction

May 2018

Introduction

Nearly every government today is under pressure to fund services for citizens. Those services include building new infrastructure and upgrading existing facilities. Governments need to continually invest in roadways, transit systems, buildings, land development, power and water systems, and many other projects. Due to various constraints (including funding), most governments have a significant backlog of work.

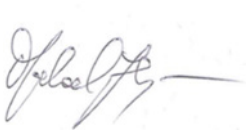
Governments are also perennially short on money. But given ongoing demands for infrastructure investment, this funding gap needs to be bridged. That means the private sector inevitably will play a role in many public infrastructure initiatives in the coming years. Corporations and governments will need to collaborate on financing for these much-needed initiatives. Deloitte has extensive experience in bringing together these very different stakeholders to deliver successful large-scale infrastructure projects.

Deloitte Global Financial Advisory teams have rich experience working with both the public and private sectors. While historically these teams have put greater focus on the private sector market, the public sector clearly offers tremendous opportunity, especially when it comes to financing and procuring infrastructure projects.

For members of Deloitte's Financial Advisory team, this document provides an introduction to financing and procurement for public sector projects with private sector participation. It offers information on the gap between infrastructure needs and infrastructure spending; what a successful infrastructure project looks like; the business model for this kind of project; how value capture works; how to match a given project with appropriate funding/financing; and the range of available procurement structures. Throughout the report, we illustrate these points with real-world case studies.

Armed with the information in this document, Deloitte's Financial Advisory teams should be able to start productive conversations with public and private sector clients operating in the public sector space and pursue new opportunities. Then our subject-matter experts will be available to assist you in winning new mandates.

I hope you find this useful.



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Global Financial Advisory
Public Sector Leader

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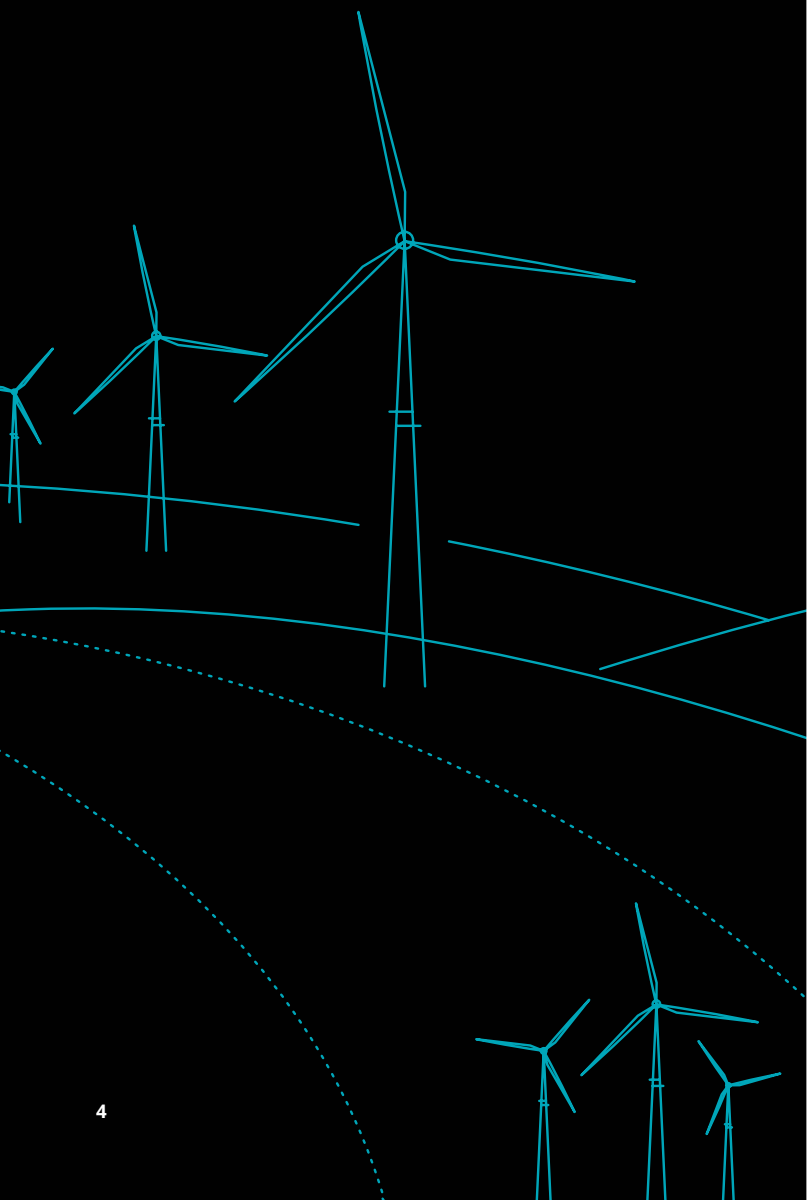
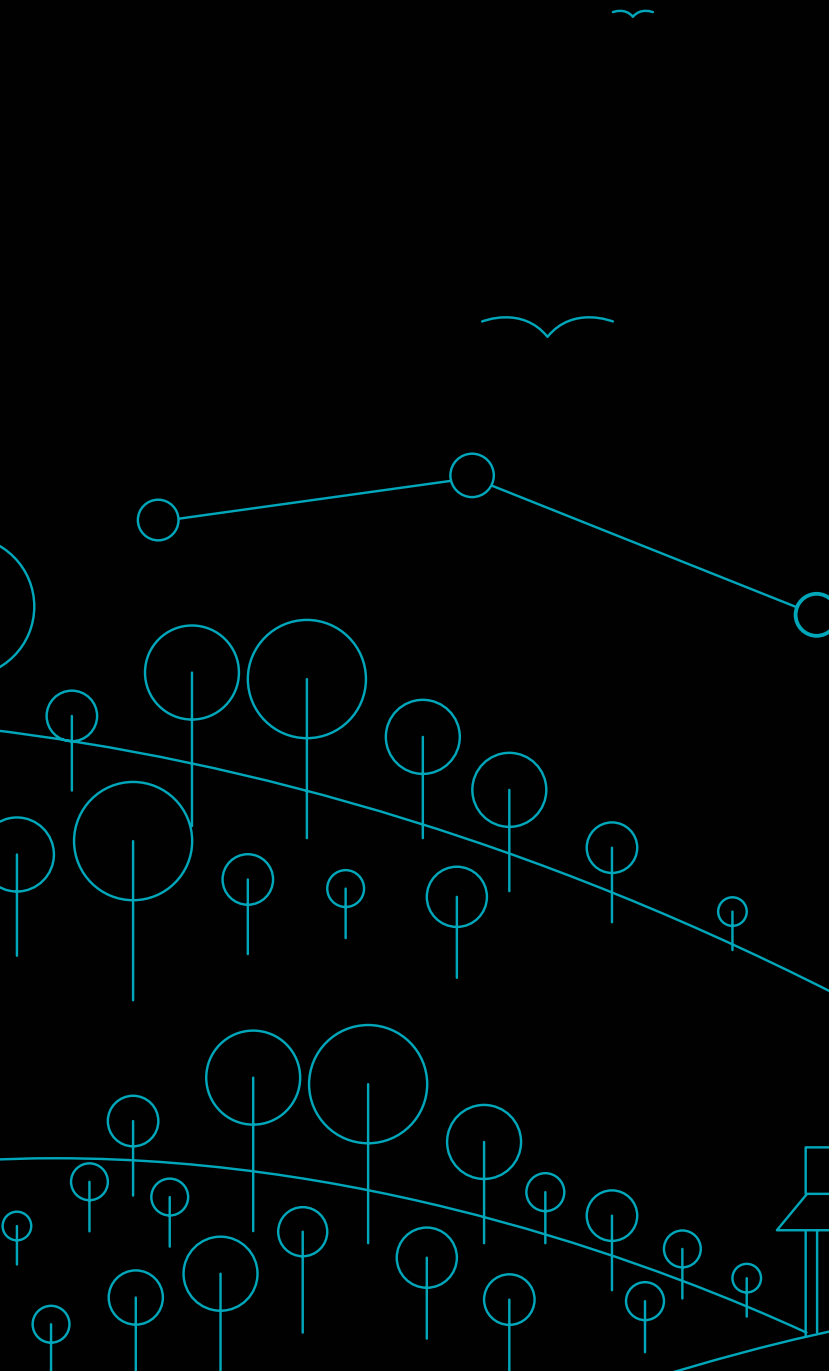


Infrastructure spending gap



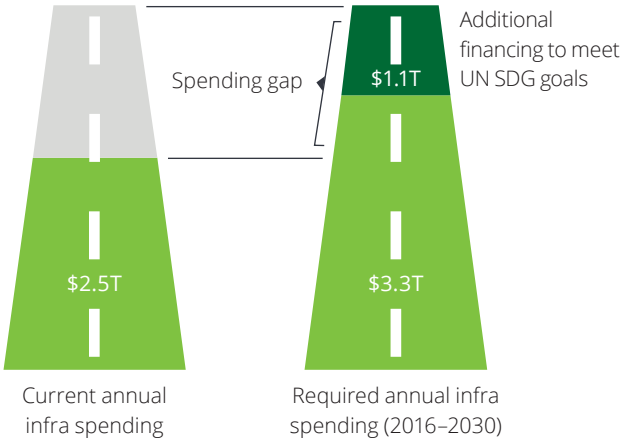
Rising infrastructure needs

Governments around the world spend a great deal of money on building and repairing crucial infrastructure. But those expenditures amount to far less than is required to meet the world's current infrastructure needs, not to mention the new needs that will emerge in the future.

Today, governments invest a total of about $2.5 trillion a year in transportation, power, water, and telecommunications systems that provide essential services and support economic activity. That is not nearly enough to meet current demand, especially in the developing world. And the need for investment will only continue to grow. According to estimates from McKinsey, to support expected rates of economic growth, the world will need to spend about 3.8 percent of GDP on infrastructure through 2030, an average of $3.3 trillion a year (see figure 1).[1]

On top of that, governments will likely have to spend even more to mitigate climate change and cope with its effects. It will take substantial funding to achieve the United Nation's Sustainable Development Goals (SDGs), particularly in Africa, South Asia, and other low-income regions where residents currently have little access to basic infrastructure. The United Nations Conference on Trade and Development (UNCTAD) estimates that current spending on economic infrastructure will need to increase by a further $1.1 trillion annually to achieve the SDGs.

Figure 1. Global infrastructure spending gap



Source: McKinsey report - Bridging Global Infrastructure Gaps, 2016

While the United States and Europe have substantial needs, the bulk of infrastructure investment in the coming years will likely go to emerging economies. China has already invested a great deal in infrastructure, but its needs for the future remain vast. Other recent and relevant announcements include $1 trillion additional infrastructure investment promised by the Trump administration in the United States and about $1 trillion of investment and privatization announced for the Kingdom of Saudi Arabia through 2030.

Forces that drive infrastructure spending

Several global trends are stimulating demand for infrastructure investment. They include urbanization, increases in population, the scarcity of natural resources in certain regions, and technology developments that are changing the nature of infrastructure projects.

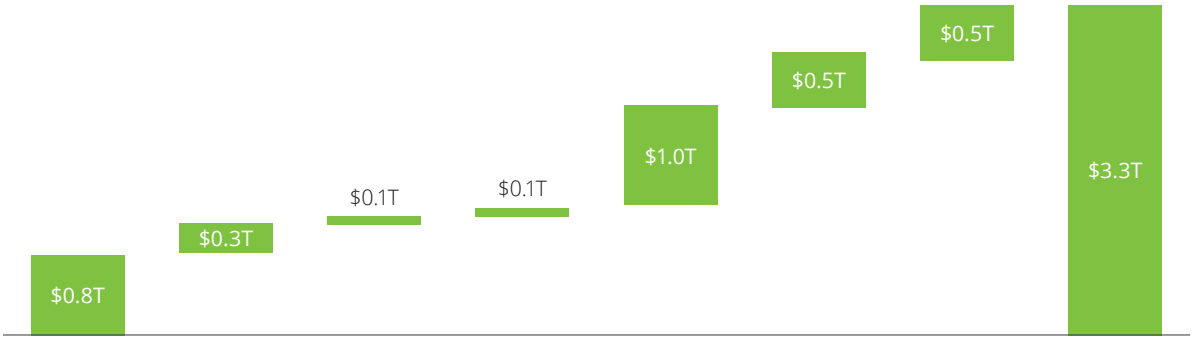
Urbanization: Around the world, and especially in emerging markets, the appeal of urban life continues to draw large numbers of people into urban centers, with an estimated 3 million people moving to cities every week. By 2030, roughly 60 percent of the world's population will live in cities, making infrastructure an essential priority for urban planners. As metropolitan areas grow, governments will need to further invest in railroads, highways, bridges, ports, airports, water, power, energy, and telecommunications (see figure 2).

Growing populations: Rising birth rates in certain countries, coupled with increasing life spans, are making it necessary to invest in new social infrastructure and education. Many emerging markets, with their high birth rates, are investing in schools and universities. In many developed economies, a "silver tsunami" is prompting investment in health care facilities and retirement homes.

Scarcity of natural resources: World population is expected to reach 8.3 billion by 2030, placing an ever-increasing demand on the world's supply of clean water, fuel, and other resources. As countries invest in extraction and distribution systems, they will increasingly rely on technological innovations to make processes faster and more efficient. A greater focus on non-carbon fuels has created a push toward renewable sources such as wind, solar, biomass, and battery solutions. However, strategies based on these new energy sources often require government support, particularly in the early years.

Smart infrastructure: Technological breakthroughs are changing the very nature of infrastructure investing as well as the speed and efficiency of the investments. In addition to increased urbanization, there is also a greater focus on smart cities globally. While difficult to pin down in a simple definition, smart cities involve greater use of advanced technologies to deliver services, including infrastructure, to citizens. Increasingly, plans for infrastructure projects include not just money for building roads, bridges, or sewer systems, but also for digital technologies that can help to deliver services more efficiently, or to provide additional services. Providing simple smart services, such as data collection or widespread broadband availability, also requires the government to make infrastructure investments. For example, it might need to upgrade a data network to accommodate additional traffic, or build more energy-generation capacity. A new complexity arises from the fact that even the most advanced technologies tend to become obsolete in a few years. Including those in longer-term infrastructure projects can create challenges for financing and procurement. However, given the drive for smart cities, governments need to address these challenges and solve them for the future.

Figure 2. Average annual need, 2016–2030 by sector ($ trillion, constant 2015 dollars)



	Roads	Rail	Ports	Airports	Power	Water	Telecom	Total
Annual Spending % of GDP	0.9	0.4	0.1	0.1	1.1	0.6	0.6	3.8
Aggregate Spending 2016–2030 $ T	11.4	5.1	0.9	1.3	14.7	7.5	8.3	49.1

Source: McKinsey report - Bridging Global Infrastructure Gaps, 2016

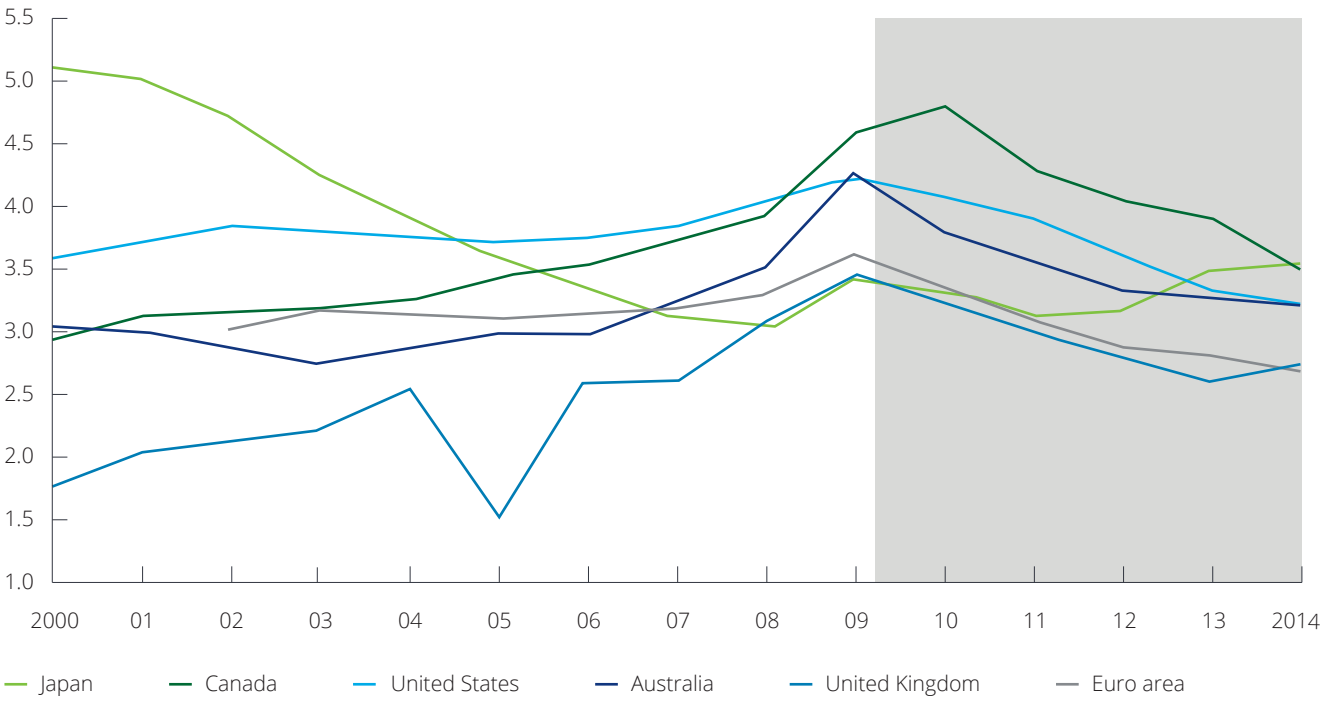
Declines in public investment

Despite these increasing pressures to step up the rates of infrastructure development, infrastructure investment as a share of GDP has actually dropped since the 2008 financial crisis. In the immediate wake of that emergency, large infrastructure projects featured heavily in the spending programs that developed nations launched to stimulate economic recovery. But those initiatives peaked around 2009. Since then, many developed nations have actually cut back on infrastructure spending, which further increases the funding gap for the future (see figure 3).

Those investments are unlikely to rebound if governments keep financing infrastructure projects as they have in the past, mainly with public funds. In many economies, government deficits, increased public debt-to-GDP ratios, and, at times, government's inability to deliver efficient investment spending, have forced public officials to reduce the funds they allocate to infrastructure.

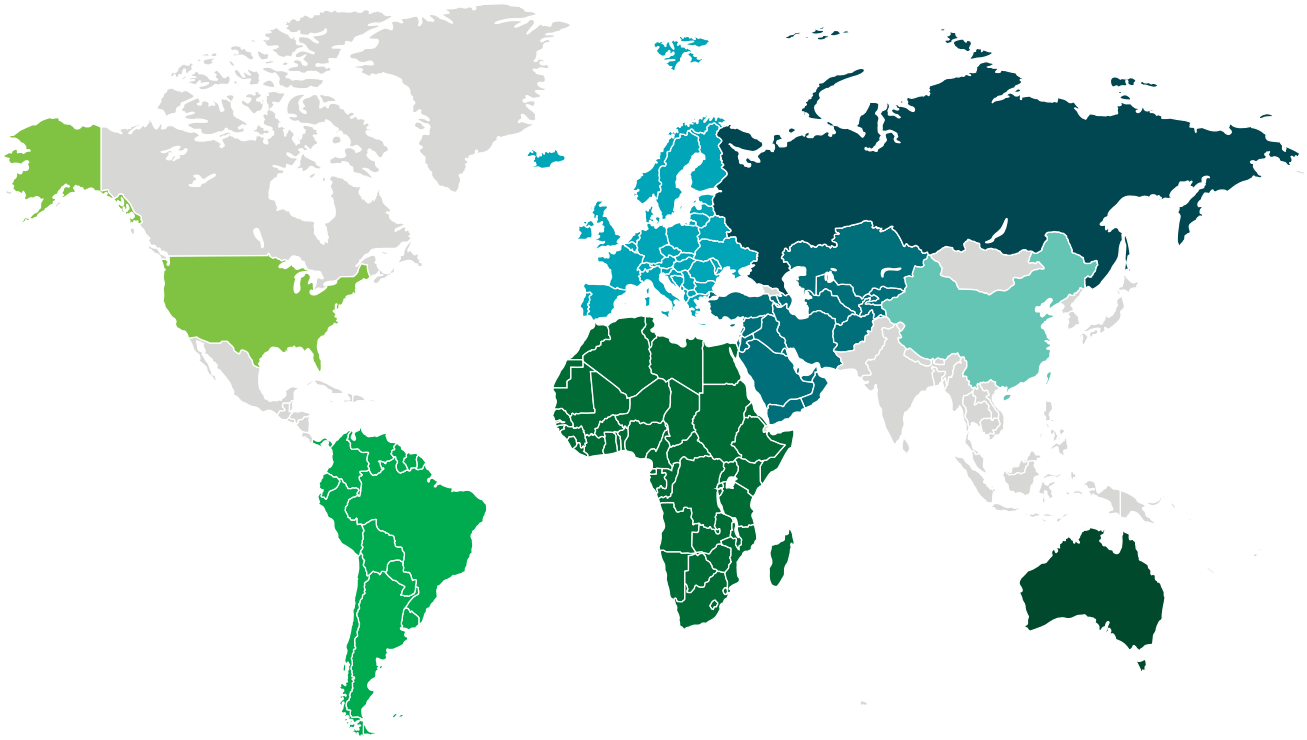
If governments want to close the gap between accelerating needs and shrinking budgets, they will likely have to embrace new models for financing infrastructure projects. This will involve Private Sector Participation (PSP) in public delivery (see figure 4). The key to making such participation work is to ensure that the chosen model is appropriate for both the public and private sectors, while achieving overall government objectives.

Figure 3. General government gross fixed capital formation as share of GDP



Source: McKinsey report - Bridging Global Infrastructure Gaps, 2016

Figure 4. Regions shifting to innovative PSP financing methods



United States
Traditionally financed through municipal bonds, now adopting various financing methods like value capture, user and linkage fees, privatization.

Europe
Relatively sophisticated market; however, reduced levels of PPP projects in recent years. Increasing focus on PSP including value capture for future development.

Russia
Majorly state funded, adopting more funding options like privatization.

China
Majorly government funded, shifting its reliance on new bonds types and PPPs.

South America
Growing PPP market with new projects being announced by various countries.

Africa
Major developments have been generally through grants or long-term loans often funded by international donor agencies.

Middle East
Increasing funding gap due to price of oil. Beginning to embrace private sector participation with variety of solutions including privatization.

Australia
Utilizing PPP and asset recycling as methods of delivering and funding required investment.

Launching a successful project

A government conducting a project can choose from among several different funding or financing models. But all successful projects should start with the same set of preliminary steps. First among those is determining the business model and business case. Typically, the level of volatility of revenues or costs will affect the volatility of the business model. For example, a business model based on revenues sourced from third parties will have greater risk associated with cash flows compared to a model with revenues provided directly by government. The level of volatility risk will impact both financing and procurement options.

Before considering the steps, it is important to understand the distinction between funding and financing from a public sector perspective.

Funding: Government provides a specific amount of money for a specific purpose (e.g., to a project), usually free of charge (interest free), with no expectation of repayment.

Financing: Someone (usually financial institutions) provides an amount of capital (debt or equity) to a project. This is expected to be repaid with interest.

The following steps help determine the potential for different procurement structures and finance sources relating to public sector projects. If it is not possible to obtain external finance directly, funding from government can also be financed at the government (rather than project) level. That means the government borrows monies directly and then provides them to the project(s).

1. Understanding project and value

Officials need to gain a full understanding of the business model that the proposed project will follow. The model includes the project's financial dynamics, its potential risks, when costs will be incurred, and when revenues will start to flow in (including potential sources of revenue). Participants also should determine whether the project will generate any free cash flow (cash remaining after all costs have been paid) that can be used to repay any external financing (Project Business Model). The risks associated with this free cash flow, quantum, certainty, and source will determine what type of finance may be sourced. The sources of revenue will often determine the level of risk linked with project cash flows. If all revenues will be funded by government (hence the rationale is to spread payment over the life of the asset rather than incur an up-front CAPEX cost), then greater focus can be placed on reflecting the reduced risk in the cost of finance (returns). It is critical that the government not simply leap to a predefined solution (e.g., PPP), particularly if that solution is not tailored for the local market. For some projects, it might be possible to combine public and private sources of finance/funding, but only if the project is expected to bring in enough free cash flow to repay any loans from the private sector. This financing will come at a premium, depending on the level of risk transferred.

Understand value generated

An infrastructure investment can generate value directly (e.g., ability to charge usage fees) and indirectly (e.g., land value increases in adjacent areas). Government should try to capture a portion of this value to help fund the specific project or future expenditures. Other forms of value capture include the sale of government-owned assets (asset recycling) and utilizing these funds to pay for investments.

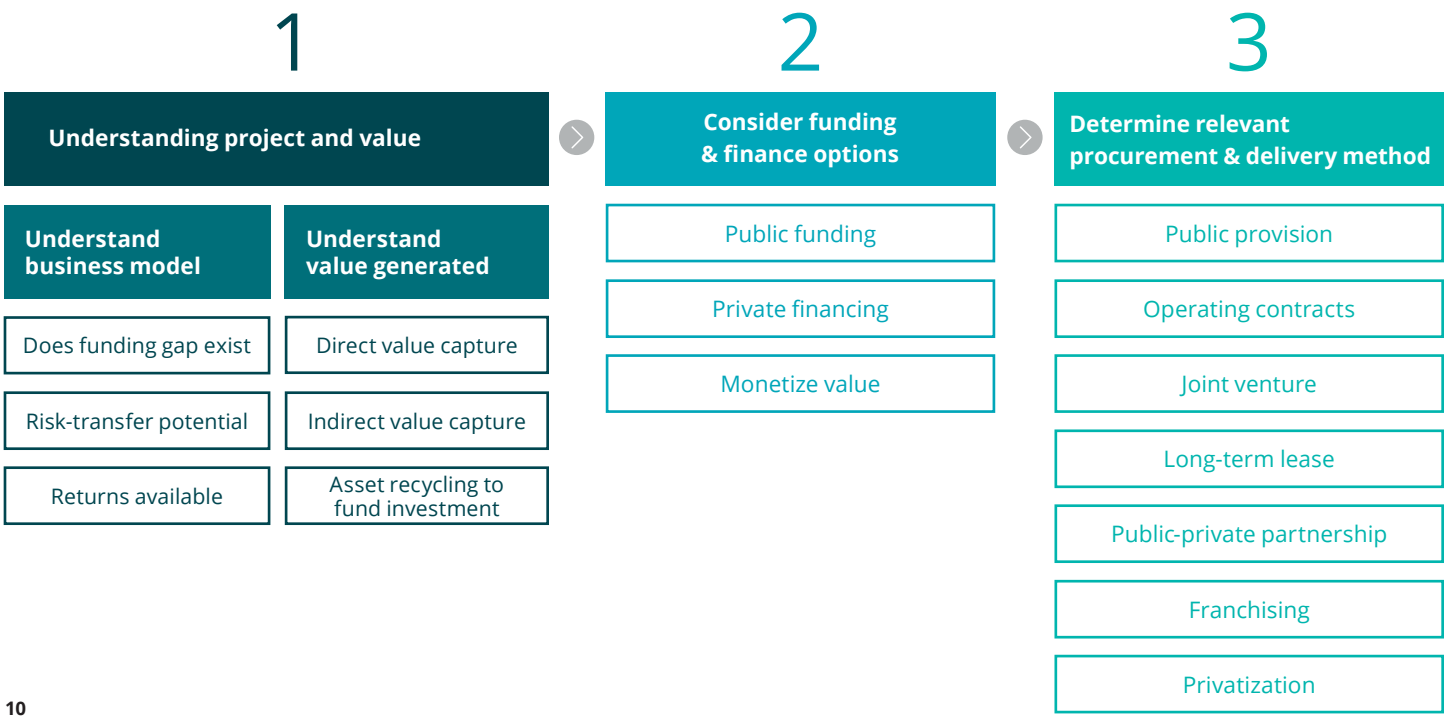
2. Funding and financing options available

Having determined free-cash-flow levels and any contributions from value capture, one can now determine the type of financing available. This financing may come from public or private sources, in the form of debt or equity, depending on the cash flow available. If the government has sufficient funds available, or if the project does not have enough free cash flow to repay finance, funding may also be available from the government to meet the capital investment requirements. When only part of the capital investment amount is funded by government, and private finance is raised for the balance, this is often known as "blending" finance.

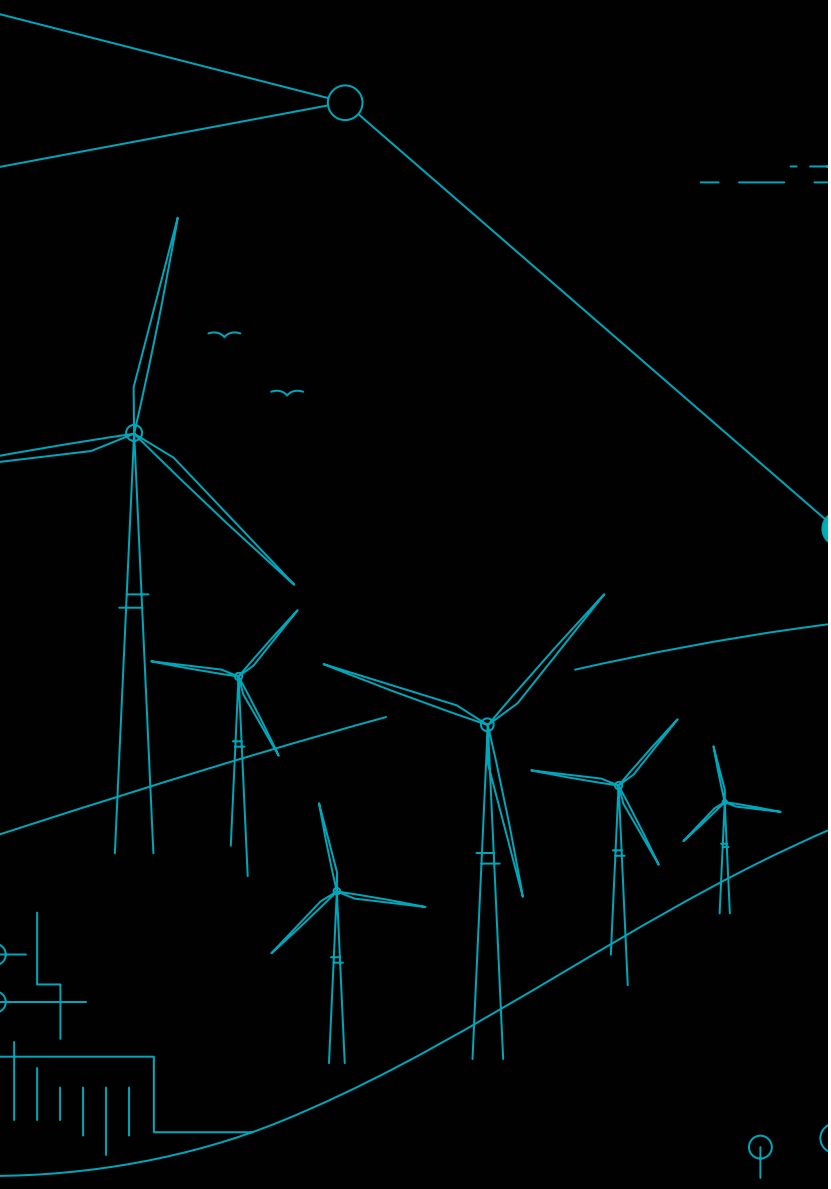
3. Procurement & delivery model

The final step is to define the appropriate delivery and procurement mechanism for the project, to ensure that it achieves the required outcomes, including optimal risk transfer. This is essentially a definition of the proposed contract structure, bringing together the public and private funding and financing elements of the project. The critical element of this entire process is that the government does not decide in advance that it will use the Procurement & Delivery Model (see figure 1).

Figure 1. Model for delivering a successful project



Understanding the business model



This is the starting point for any project. It involves considering all the elements related to the project, from revenues and costs (CAPEX and OPEX) to project risks, plus the potential for sharing risks with, or transferring them to, any private sector partner.

At the end of this process, the project sponsor should know how much free cash flow (revenues less all costs) to expect. A relevant risk review of the project, to determine the sensitivity of the level of free cash flow, can determine how much reliance to place on this value. The sponsor will use this free cash flow to satisfy future finance repayments (capital and interest).

What is the revenue model?

When a project involves any level of private sector participation, the sponsor should consider the issue of revenue streams, to determine how costs can be repaid over time. Because many "public" assets (e.g., road, school, hospital) lack any kind of typical revenue model, many infrastructure assets delivered by the private sector must receive revenues directly from the government (e.g., availability payments under a PPP model). These revenues are generally linked to the service being provided. Although third-party revenues can supplement or replace government payments in certain projects, this creates a different type of revenue risk. For government, the benefit of creating this revenue model (whether supplemented by third-party income) is that payments can be deferred over time. This allows a greater level of immediate development utilizing scarce cash resources as well as matching the costs to the benefits generated over time. Whatever the revenue source, any sponsors and financiers must get a full appreciation of all risks relating to revenue generation.

Revenue models utilized

Type	Source	Description
Financing model payments	Public sector	Payments received that match agreed cost (including finance) amounts, allowing full coverage of expenditure and agreed returns.
Availability payments	Public sector	Payments received that are linked with the performance of the private sector operator and availability of the service/asset in line with agreed performance standards.
Savings sharing	Public sector	Certain services will generate savings for the public sector. If quantifiable and accountable, those savings can generate a budget to help fund the associated assets/service.
Shadow tolls	Public sector	Public sector makes payments to the private sector based on usage of the service/asset. In some cases, recurring payments may apply so as to reduce risk.
User fees/charges	Third parties	Users pay directly for services (e.g., road tolls). This tends to be riskier than public sector payments due to direct risk.
Rate-type payments	Third parties	The public sector collects revenues from the public and utilizes these to pay the private sector for specific services/assets (e.g., power generation/ water utilities).
For smart cities projects where greater levels of technology are involved and revenues are more service based, the following additional revenue models may apply.		
Recurring or "pay as you go"	Third parties/ public sector	Services are charged to users on either a recurring or "pay as you go" basis, depending on the customer's preference. Can be collected using billing system of mobile operator.
Subscription ("all you can eat")	Third parties/ public sector	User pays fixed amount for service irrespective of level of usage.
Advertising based	Third-party advertising	Revenue streams are generated by selling advertising on asset space rather than collecting from individual users. This allows service providers to provide service free (or inexpensively) to users. Example: Wi-Fi kiosks in New York provide a free service underwritten by advertising income.

The strength of the economic business case for the project, and levels of revenue generation relative to service/asset cost, will determine whether the private sector will retain all revenues generated from third parties or share them with the public sector.

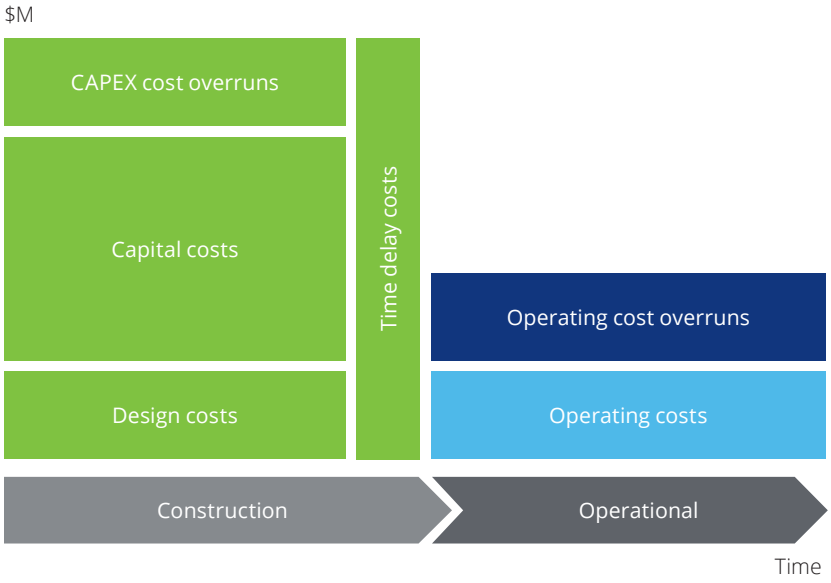
What is the revenue/cost model?

Construction and operational period costs

Whether a public or private sector organization manages an infrastructure project, the flow of costs (construction and operation) will be similar. In both cases, the parties in charge must take care to avoid cost overruns and expensive delays. The ability to manage these risks may vary between the parties, which can become a differentiator.

The diagram (see figure 1) illustrates the typical costs and risks in a new infrastructure project and their timing. Typically, one can estimate costs with reasonable accuracy in the early stages of the project, allowing participants to determine the overall funding requirement, subject to adjustment for potential risk factors that may apply.

Figure 1. Project costs – cash-flow timing



What are the risks?

In any project, the various stakeholders (the construction company, the operator, the public sector, the lenders, the investors, and the public and private sponsors) all need to identify any risks the project might incur and develop strategies for mitigating those risks. Because this document concerns financing and funding, we have focused on those particular risks. But financiers need to consider all elements of the project because risk influences repayment requirements.

Risk evaluation

Before becoming involved in a project, potential financiers (debt and equity) carry out a thorough project analysis, including an assessment of all factors that might affect cash flow. A lender will look at all of the project assumptions, consider if those projections are reasonable, and then consider whether the project can maintain sufficient cash flow to meet its loan obligations. Equity investors will also examine the project's projected performance, but they will focus more on the return they can expect and factors that might influence that return. Risks can vary depending on the size of the project, sector, revenue model, level of technology involved, types of operation involved, and the number of parties involved. And risks do not occur in isolation: the existence of one risk may increase the importance of other risk factors. For example, increased levels of technology in a project may affect operational risk, as well as obsolescence and replacement risks. Those in turn will impact financing risk and associated costs.

Here are the main risk headings that a project team should consider when assessing an infrastructure project:

a. **Construction risk:** This includes anything that can cause non-completion, late completion, or cost overruns. The complexity of the construction/design, experience of the contractor, and strength of the supply chain may all influence the level of risk in this area.

b. **Sponsor risk:** Since the sponsors will provide the equity or subordinate debt, lenders need to assess the levels of capital provided and the ability of the sponsors to access additional capital, if required. Lenders also evaluate whether the sponsors have the resources and skills necessary to deliver the project on time and on budget, and can resolve any problems encountered during construction.

c. **Operating risk:** Once a project is constructed, the lenders will mainly be concerned with the project operator. They will require a qualified operator (generally selected in advance of construction) to maintain the project within the limits of the operating budget. They will also determine whether the operator has allocated enough money, and has access to enough trained personnel, to operate and maintain the facility. Because the operation of the project and provision of the service often affects payments to the sponsor, any operational problems can have a direct impact on performance payments, and hence the ability to meet finance payments.

d. **Technology risk:** Lenders worry that if any technology used in the project performs badly that will hamper operations, the project will lose revenue, and the sponsor won't be able to repay its debts. This is one of the main reasons why financiers and sponsors seek tried and tested technologies that are not likely to become obsolete during the life of the project. When the life of the technology proposed doesn't match the term of the project/finance, the risk of problems connected with obsolescence, replacement costs, and future operating costs becomes more significant. Lenders may ask the project sponsors for additional support and guarantees to mitigate this risk. These could take the form of additional equity support or support requirements from the public sector. An alternative is to pass the risk to the technology vendor. However, this may not provide the necessary comfort, as not all technology companies have sufficient balance sheet strength to provide the financial support required. This issue is one of the main obstacles to finance in smart cities implementations, particularly where technology is combined with long-term infrastructure projects.

e. **Environmental and planning risks:** To protect themselves against environmental liabilities, lenders will want to confirm that project sponsors have obtained all the necessary consents and approvals connected with planning, the environment, and similar concerns. Lenders may also consider how changes in environmental regulation in the future could affect the project's future economic performance.

f. **Legal risks:** These occur where laws are uncertain or subject to change. Lenders will seek legal opinions from local counsel to ensure that all the project contracts are legal, valid, binding, and enforceable under the relevant laws. Change of law impacts are generally under the control of the government and are generally considered in the project agreement. These risks are generally retained by the government.

g. **Force majeure risk:** This refers to a risk that is beyond the control of any parties to the project. Typically, it involves "acts of God," such as severe weather. A force majeure clause in a contract is often used to excuse any party's performance in the face of such an occurrence.

Managing risk

Risk mitigation is an action that is taken to (i) reduce the likelihood of a risk materializing, and (ii) reduce the consequences should that risk materialize. The action taken will vary, depending on who is incurring the risk and what kind of risk it is.

a. **Portfolio management:** To manage their risk exposure, lenders establish mandates and criteria that govern how much exposure to allow in each investment. These mandates set loan limits and dictate the type of projects and sectors they are willing to invest in. Furthermore, international financial institutions set specific limits for each country in which they issue loans. The more unstable a country's economic health, the lower the limit. Lenders may also use syndication arrangements to spread the risk by involving other experienced financial institutions.

b. **Guarantees:** A common belief about public-private partnerships (PPPs) and other Private Sector Participation transactions is that they should be entirely self-supporting, with no guarantees from the government or private sponsor. Nevertheless, guarantees are sometimes necessary where there is such increased risk that the project is not deliverable economically, or bidders will not get involved due to associated risks. The guarantees can be provided via the sponsor or from the procuring agency, depending on the risk being mitigated and other circumstances. In many cases, country risk is a key factor, and guarantees from multilateral organizations (e.g., World Bank, UN, EU, etc.) are required to attract bidders and allow external finance. Guarantees need not add to the cost of a project. They can be as simple as the assurance that if laws or regulations related to the environment, taxes, or other areas should change, and if those changes would harm the rights of the project sponsors or lenders, they will not apply to the project, or the project will be compensated appropriately.

c. **Financial accounts:** Financiers want to ensure that they are repaid if they have any concerns regarding the flow of cash, apart from contractual obligation to pay. They may require all revenues to be paid immediately to a separate bank-controlled account, from which finance payments and other necessary payments are made, after which monies can revert back to the control of the sponsor. The project will also need to hold various reserve accounts (dependant on risks) to fund any shortfalls in debt service, maintenance, or change of law.

d. **Interest rate/Fx risk:** To protect themselves against fluctuations in interest rates and currency exchange rates, lenders will typically require sponsors to enter into hedging contracts such as swaps. In a swap, two parties agree to exchange currencies, interest payments, or commodities at set rates at an agreed future date. These financial devices manage the cost impact of future price movements.

e. **Insurance:** Although it is possible to manage many types of risk, some hazards are simply unavoidable. Insurance can protect a project against risks such as force majeure or political crisis. The terms of the insurance policy, specific to the project, will be outlined in the contract. If the sponsors need to file a claim, the payout will allow them to get the project back on track or repay any outstanding loans.

f. **Debt covenants (DSCR/LLCR/Lockups):** Typically, private finance providers will require the project cash flows to retain sufficient head room to ensure (at least) their finance payments will be made as planned. Various covenants (financial promises) regarding minimum cash levels (calculated using agreed ratios) will be included in the contract documentation. If these are not achieved at any point, they will trigger default mechanizors. These rates include:
   - **Debt-Service Coverage Ratio (DSCR):** Measure of cash flow available to pay current debt obligations due within a defined period (e.g., one year).
   - **Loan Life Coverage Ratio (LLCR):** Measure to estimate the ability of the project cash flows to repay the full loan. Calculated by dividing the net present value of the money available for debt repayment by the amount of the outstanding debt.
   - **Lockups:** Should any covenant be breached, lockups of cash will occur where no other payments (except necessary operating costs) will be made until the covenant issue is addressed and solved.

g. **Step-in rights/Events of default:** Should a project get into financial difficulty, it may breach its debt covenants. The finance provider will then have the ability to ensure that the breach is rectified within an agreed time frame. Otherwise, events of default may arise, allowing the finance provider to "step in" and take control of the project. This allows the finance provider to make whatever remedies are required in order to protect its money, including replacing the operator or even selling the project. The extent of the finance provider's powers may be restricted by the contract (project agreement) between the project and government.

h. **Reserve accounts:** To protect against covenant breaches and/or events of default, the project company may decide upon (or the finance provider may insist upon) setting up several reserve accounts. These will hold sufficient funds to cover certain future payments in the event of a shortfall in project cash flows. The funds can be held as cash in accounts or facilities in place if need arises. Examples include:
   - **Debt service reserve account:** Covers all debt payments over future period (e.g., six months).
   - **Maintenance reserve account:** Covers future expected maintenance payments over an agreed period.
   - **Change of loan facility:** Facility in place to cover the impact of any potential loan change that may have negative cash impact on the project cash flows.

i. **Gearing limits:** While gearing typically relates to assets whose determined value is based on the value of the underlying asset rather than the cash flow, gearing is considered in infrastructure relative to capital expenditure. The level of gearing is generally linked with the revenue model. A government covenant or the revenue typically allows a greater level of debt gearing (up to 92 percent achieved on certain PPP projects in Europe). The ultimate gearing is often determined by maximum bank debt levels and ratio calculations determined by finance providers.

j. **Scenario and sensitivity analysis:** Detailed financial modeling of the project is required to determine the finance sources and structures available, based on all the parameters and constraints involved. To test the robustness of these assumptions, detailed scenario and sensitivity analysis is carried out to ensure that the project remains viable under various potential downside scenarios.

k. **Parent company guarantees from contractors:** Project companies often stand by themselves, with no recourse or support from affiliated companies. Hence, if the project company is not properly capitalized at the start, future difficulties may arise. To cover this eventuality—where a sponsor may not be keen to invest more funds at the start but acknowledges that more may be required in the future—the future support can sometimes be provided by a guarantee. The guarantee can be open ended or for a finite amount, and the project may draw against it in situations that the parties involved have agreed upon in advance. Participants often presume that sponsors will automatically invest monies to protect their existing investments, but this is not always the case. A guarantee ensures that such investments will occur if needed. The sponsor will consider this potential exposure a financial risk and will typically look for some level of return on this risk.

l. **Liquidated damages:** These are amounts ideally agreed (within the legal documentation) to be paid as damages in compensation for a specific breach (defined in the contract).

m. **Performance bonding:** A written guarantee from a third-party guarantor (usually a bank or insurance company) to a client/customer/government that ensures payment of a sum of money (with an agreed maximum) in case the contractor/sponsor fails in the full performance of the contract. If the sponsor provides this guarantee, it may seek to pass the risk down to other subcontractors involved in the project, which would back any overall bonding provided at the sponsor level.

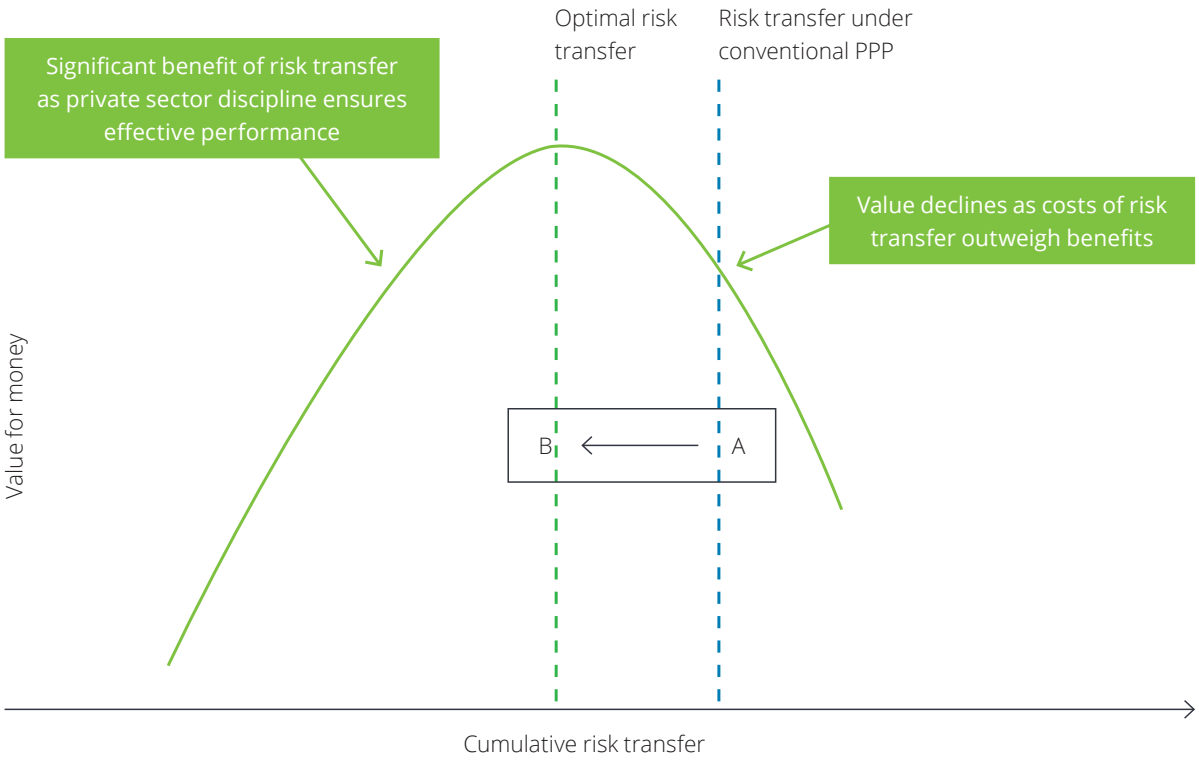
Potential for risk transfer

One of the biggest factors that keeps public sector infrastructure projects from achieving value for money is risk allocation from the public to the private body. Public sector partners are continually tempted to try to pass all the risk to the private sector. This can lead to increased cost and complexity, as the private party charges a premium (return) for the risk transferred. Of course, the private sector partner will seek to put protections in place to anticipate and manage risk. However, there are some risks that only the public sector can control, such as risks connected with future legislation. If the government partner insists that the private sector partner assume such a risk, a risk contingency will be included.

The key is to optimize, rather than maximize, the level of risk transfer. When the project allocates risk to the entity capable of controlling the outcome, it will usually generate greater value for money. That strategy also makes it easier to reward private sector partners when they deliver on their obligations and to penalize them for poor performance, as there is greater clarity around the responsibility of the private sector partner.

One of the major criticisms of PPP models is the perceived lack of value for money generated for the public sector. Sometimes, however, the private sector partner fails to deliver value for money only because it is forced to assume too much risk. Figure 2 illustrates the need to consider a balanced approach when deciding how much risk to transfer. In the diagram, the cost of the risk can be reduced from Point A to Point B in certain cases where the public sector is better placed to assume a particular risk (e.g., change of law risk). In this case, were the private sector to retain this risk, it would seek to charge for the associated risk (A), whereas it can reduce its price to B if the risk is not transferred. While this isn't always the case, sometimes the cost of retaining the risk is minimal for the public sector yet significant for the private sector to accept. Hence, an unsophisticated blanket approach to risk transfer brings the possibility of increased cost, unnecessarily. A numeric indicator of the relative level of risk in various projects is the level of return sought by the private sector relative to its investment—Internal Rate of Return (IRR).

Figure 2. Balanced approach to risk transfer in PPP models



To accurately assess the value created by a particular partnership structure, the agreement must be transparent about the public and private sector costs. An accurate assessment also requires that the parties make realistic assumptions about whether the project could actually proceed through the traditional means if a PPP would not produce value for money.

Integrated map for infrastructure development

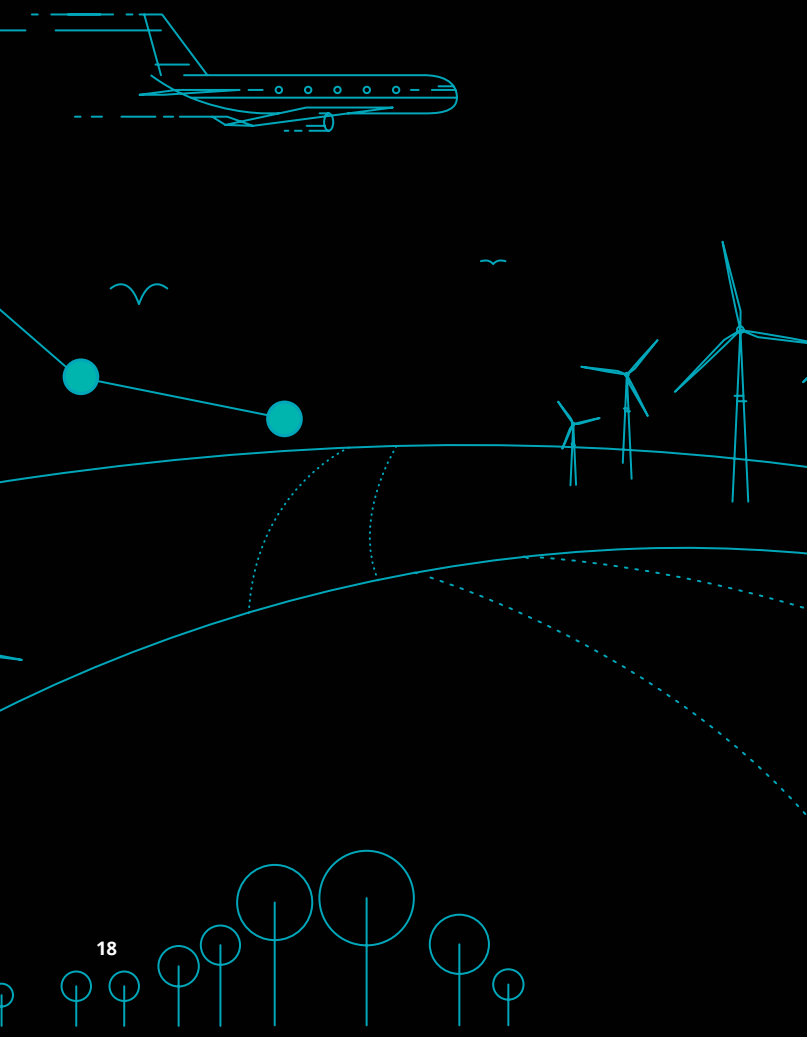
Step	Considerations	Key questions	Impact on private involvement
Determine public authority. (What do I have permission to do?)	Laws and statutes	What laws and policies exist regarding private financing and delivery of infrastructure?	A poor legislative and statutory environment can make it difficult to gain private sector participation in infrastructure development.
	Political	Are there political constraints that would make it difficult to use certain partnership structures?	Many jurisdictions are limited in the type and level of responsibility they can allocate to a private partner.
Define project needs and objectives. (What do I want to do?)	Speed	How quickly does the asset need to be delivered?	Traditionally procured projects typically begin sooner and have shorter procurement cycles, while PPPs are more likely to be completed on time.
	Efficiency	How can the asset be delivered and maintained as efficiently as possible?	Properly structured partnerships focus the contractor's attention on delivering the lowest overall life cycle cost.
	Innovation	Is there an opportunity to incorporate private sector innovation?	The greater the scope for flexibility in the nature of the technical solution/ service or the scope of the project, the more opportunity for private sector innovation.
	Degree of certainty	Will changes in technology, policy or demand affect how we would meet the need tomorrow?	The greater the uncertainty about the project's scope and scale, the more likely that a hybrid PPP or traditional procurement is the best option.
Determine the best "owner" for each project component. (Who can and should do what?)	Financial	Who is going to pay for the project?	Fiscal conditions can either widen or constrain the Private Sector Participation (PSP) options available.
	Capabilities	What capabilities are there in-house to deliver and/or manage the project? What capabilities exist in the market?	If a PSP model is chosen, the public sector must create the institutional capacity to manage a complex set of contractual arrangements.
	Risk	How much risk should be transferred? Who is best able to bear what risks?	Optimal risk allocation is critical to successful partnerships.

What is the free cash flow generated for financing?

Assuming that all capital expenditure costs are funded in full either by the government or through private financing (debt and equity), free cash flow available for finance payments is calculated during the operations period. Effectively, it is the difference between revenues generated and all operating costs (excluding financing costs). The potential to raise private finance for a project will depend on whether the free cash flow generated is sufficiently large to satisfy the ongoing service payments (interest and capital) for the required finance.

Understand value generated

Value capture and asset recycling



Introduction

Value capture involves capturing some of the value that the infrastructure investment generates directly or indirectly. It is normally defined as the difference between the value of the infrastructure before and after making improvements. Government can use value capture to reduce the size of the investment (direct and indirect) it needs to make in a project, or to increase the level of ongoing funding available to service financing. While there are challenges to monetizing the value of an asset, government is best positioned to do this. Government must separately consider each project, and where it is generating value, to determine the optimum value capture strategy.

In addition to value capture, a government may use asset recycling to supplement government funding, either directly or indirectly. Most governments own many assets, some of them very valuable. The government may decide that it doesn't need all of these assets, or they would be better off held in private ownership. Selling such assets is called asset recycling. If the recycled assets are directly connected with a particular project, not only will the sale generate value, but the government may be able to generate additional value using value capture techniques.

What follows is a summary of the ways in which government can use value capture and asset recycling in infrastructure (including smart cities) projects.

Direct	Where additional value is generated directly within a project/ investment (e.g., profit/revenue share). This is generally achieved through agreement within the investment documents. It involves projects where the government and private sector are direct parties to the agreement.	• Revenue share • Profit/Returns share • Refinancing gain share • User fees • Impact fees
Indirect	Where additional value is generated as a result of government/ regulatory decisions (e.g., change in land use) and/or infrastructure investments (e.g., transit), which benefit parties other than users of the infrastructure (e.g., developers and landowners). This is generally achieved by utilizing government-based levies/taxes, either on a general or focused basis, to capture a portion of incremental value in private sector assets.	• Land value enhancement • Air rights sale • Adjoining sites/Land swaps • Increase in value of government land holdings
Asset utilization/ recycling	This involves utilizing existing assets to stimulate private sector development or using the proceeds from sale/privatization of public assets to fund future infrastructure development. It can involve the sale of assets that may be surplus to requirements, sale and leaseback of assets to avail of current capital value, or land swaps/share to assist in private sector development with respect to viability and/or access to land. The objective in this element is to utilize existing assets to enhance the overall government portfolio while achieving value for money.	• Asset sale/Privatization • Sale and leaseback • Joint venture • Asset swap • Operational contracts • Revenue securitization

Direct value capture – revenue share/profit share

In developing any project, the public or private developer needs to ensure the overall viability of the project. Various types of finance have different requirements for level of return, headroom of cash flows available, and cost levels. However, sometimes projects generate greater financial returns than expected. When this happens in a project involving the public sector, every effort should be made to try to capture a fair share of the value gain. As with risk transfer, the public sector should not overextend its demands in this area. Since the private sector operator is usually responsible for such gains, that partner should receive incentives for excellent performance. Some of the gain shares that are achieved in this area include:

Revenue share	Where revenues exceed a particular level, partners may agree to share the excess.
Profit/ Returns share	Where profits returned to the sponsors exceed planned levels, the public sector should receive a share of the excess over the agreed base-level internal rate of return (IRR). As with revenue share, this must be worked out fairly and give the private sector partner incentives to focus on generating excess returns.
Refinancing gain share	While the financing will be put in place at the start of a project, sometimes changes in circumstance alter the financiers' view of risk. These changes can relate to the specific project, the stage of development (construction versus operations), or the overall market environment. If the changes are favorable, the promotor may decide to refinance the project to reduce the overall cost of finance. In these circumstances, the refinancing gain should be shared with the public sector, generally in a single payment of up to 50 percent of the gain. In some jurisdictions, because long debt tenors are not available, the parties agree from the onset that they will refinance to match the debt tenor with the life of the project. Where this is the case, the public sector needs to manage the downside risk (increased finance costs) and capture a fair share of any saving achieved.

In all these cases, it is important that the sharing be fair and not put the long-term viability of a project into question. Since a single project may use more than one sharing strategy, it is important to make sure to avoid accidental overlaps, such as promising to reward two different parties for the same gain.

Revenue/profit share has been included in a number of PPP projects, such as toll roads, which receive revenues from third parties. In these cases, if revenues or returns run higher than expected, the public sector partner will receive a payment as well.

In some cases, the public sector partner is able to generate additional revenues in ways that are directly related to the project but outside the scope of the project procurement. If this is the case, the mechanism for collecting these revenues should be implemented in parallel with the project delivery. Some examples include:

User fees	Cities and other local jurisdictions to impose user fees to fund services and service enhancements that increase the quality of life, and to cover administrative and regulatory processes. Governments should put more emphasis on the potential to collect revenue from users.
Impact fees	These are charges on new development to pay for capital improvements the city must make to accommodate that development. These could be considered direct or indirect depending on how charges are calculated.
Tax increment financing (TIF)	TBC
Excess levies	TBC
User charging inflation rates	TBC

Direct value capture– User fees/impact fees

User fees

Cities and other local jurisdictions impose user fees to fund services and service enhancements that increase the quality of life, and to cover administrative and regulatory processes. Governments should put more emphasis on the potential to collect revenue from users.

Case study - User fees help Toronto reduce $500 million budget deficit

- In 2009, the city of Toronto experienced a $500 million budget deficit. Under Canadian law, cities cannot run a budget deficit, so the city had to either increase revenues through taxes and fees or cut expenditures to balance its budget.
- After considering other options, city leaders decided to implement user fees on a set of city services. In 2010, residents had to pay user fees for:
  - The convenience of paying a parking ticket by phone or online. Residents paid $2 for the fee service—50 cents more than the previous fee.
  - Residents who bought a new home and needed to create a property tax account were charged a $50 fee.
  - Residents with existing property tax accounts were charted $50 to make changes to their property tax bill, which was $15 more than it cost to make billing charges in 2009.
- Other fee increases included a $50 registration for families signing up for city recreation programs, gym rental fees, and drop-in swim fees.

Impact fees

These are charges on new development to pay for capital improvements the city must make to accommodate that development. These could be considered direct or indirect, depending on how charges are calculated.

Case study - Impact fees imposed by Colorado to combat street oversizing

- The City Engineering Department of Fort Collins, Colorado, uses standards to determine "street oversizing" impact fees. Street oversizing fees are determined in part by the number of lanes and miles reflected on the planned street network. Fees are calculated for all streets, collector level and above. These fees are revisited on a regular basis and recalibrated depending on changes to the Master Street Plan network.

Indirect value capture

Often, the actions of the government and the wider public sector generate incremental value for others. Although it is not always possible to monetize these benefits, the public sector should look for opportunities to capture some of the new value. The resulting revenues could be reinvested specifically in the area where the funds are collected, or they could go into the general public sector budget.

Examples of indirect value capture opportunities include:

Land value enhancement	When the government makes zoning changes or invests in infrastructure, those actions may increase the value of land in the vicinity. If the public sector incurs costs while making such improvements, it should try to recapture some of those costs. It may use taxes, levies (sometimes related to planning permissions for development), or direct charges for infrastructure access. Around the world, the use of planning levies to capture a share of the increased value resulting from new planning permissions is quite common. Sometimes, the money received is allocated directly to specific infrastructure costs. In some cases, the public sector is happy to forego this kind value sharing, since the enhancements it makes encourage much-needed development.
Air rights sale	In some cases, such as a rail project that includes new stations, it makes sense to consider the value under, over, and surrounding the new asset. When you bring large numbers of commuters to a new rail station, you create opportunities for retail and commercial development. By selling rights, creating a joint venture, or establishing an operating contract—depending on the government's appetite for risk and availability of funding—the public sector may recoup much of the cost of the new infrastructure.
Adjoining sites/ Land swaps	Often, the public sector owns sites adjacent to new infrastructure but does not have the capacity to unlock its value. Involving the private sector can help. The private sector may carry out infrastructure investment in exchange for asset swaps (transfer ownership of asset) or development rights (ability to benefit from any development on a site). One example of this is the Greystones Harbor project in the Republic of Ireland, where private developers were given the opportunity to develop real estate surrounding the newly developed harbor in exchange for upgrading the harbor (€60M cost) and operating it for 35 years. While the private element of this project got caught in the 2008 financial crisis, in line with the agreement, the harbor was fully redeveloped in advance of the start of commercial development.
Infrastructure funds/City deals	
Broad-based levies	

Case study – Denver, CO – Union Station Metropolitan District (TIF)

- Union Station will be the hub of Denver's FasTracks rail system. The project will create a multimodal transportation hub for Denver, integrating bus, light rail, commuter rail, and Amtrak.
- Voters approved a 0.4 percent sales tax increase in 2004 to help fund the project. In 2008, the city council created a tax increment financing (TIF) district (Colorado calls them Metropolitan Districts), consisting of the station and the surrounding 20 acres. The additional revenues from growth in the TIF district will be used to pay off federal TIFIA and RRIF loans. Construction on the station began in December 2012.

Case study – Downtown Kansas City, MO

- The Kansas City government established the Transportation Development District (TDD), an area around a proposed two-mile streetcar route that was identified to directly benefit from the project. The local government then put a land value capture, or "real estate tax," within the TDD, up for public vote. On December 12, 2012, residential and commercial property owners within the TDD voted in favor of land value capture to contribute funds toward the construction of the Downtown Kansas City Streetcar.
- A 1 percent sales tax within the TDD was also approved. According to the Kansas City Streetcar project website, 75 percent of the project's costs will be funded through innovative local public and private funding. Revenue from the TDD value capture and sales tax will be used to cover net operating and maintenance costs.

Case study – Air rights sales in São Paulo, Brazil

- São Paulo's highly indebted financial position forced city authorities to generate funds for infrastructure without increasing debt. Unlike many cities in developing countries, São Paulo cannot raise revenue by selling land because it possesses little developable land. Air rights sales are one of the few measures São Paulo can use to raise funds for infrastructure investment. By auctioning Certificates of Potential Additional Construction (CEPACs), the city can allocate limited air rights according to market needs at a price to be fixed by market demand.

Case study – Development rights leases in Nanchang, China

- Chinese cities have long converted rural agricultural land to urban land, equipped it with infrastructure, and then leased the development rights for a premium. Like many other Chinese cities, Nanchang funds infrastructure projects largely with revenues from development rights leases. But Nanchang, one of several forward-looking Chinese cities, is promoting transit-oriented development by creating accentuated densities (higher densities) around major metro station areas. The idea is to recoup new metro investment costs by maximizing revenues from development rights leases. The city does this by promoting efficient land use around stations, and by changing zoning to allow mixed use and higher floor area ratios. Another goal is to use transit projects to promote sustainable urban development.
- Nanchang's practice is more sustainable than the typical rural-urban land conversion, which runs the risk of unnecessarily expanding cities outward, leading to urban sprawl.

Case study – Land value increments a major source of income for Tokyu Corporation

Overview

- Tokyo has a long tradition of financing of suburban railway development by capturing the value that land acquires as public transit makes it accessible to more people. Tokyu Corporation, Greater Tokyo's private railway, was the first to implement this model. Tokyo's railway companies have historically leveraged real estate development to both pay for infrastructure and produce profits for shareholders.

Finance

- Tokyu Corporation acquired the reserved housing sites surrounding the railway after completion of the redevelopment. It then promoted the area's development by selling land, constructing housing, and attracting shopping centers and schools, which increased the population and rail ridership in the area.

Case study – Hong Kong's Mass Transit Railway Corporation

Overview

- Hong Kong's Mass Transit Railway Corporation (MTR Corp.) owns and operates the city's largest passenger rail service. Under its finance model, known as "Rail + Property," MTR Corp. develops both the rail network itself and the nearby property. When MTR Corp. makes plans to build a new facility, the Hong Kong government—the majority shareholder in MTR Corp.—gives the corporation a large, indirect subsidy by granting it exclusive rights to buy nearby properties at the lower, pre-MTR Corp. rates. The corporation then sells or leases those lands at the rates that will apply after it builds its new facility, using the profits to pay for the transit infrastructure.

Finance

- Given the high premium placed on access to fast, efficient, and reliable public-transport services in a dense, congested city like Hong Kong, the price of land near railway stations is generally higher than elsewhere, sometimes by several orders of magnitude. MTR Corp.'s active involvement in property development is what distinguishes it from other public transport organizations worldwide. The chief objective of its property development is to finance infrastructure. Besides granting MTR Corp. exclusive development rights based on the "greenfield" site value, MTR Corp. also negotiates a share of future property development profits and/or a co-ownership position from the highest bidder. Thus MTR Corp. receives a "front end" payment for land and a "back end" share of revenues and assets in-kind.

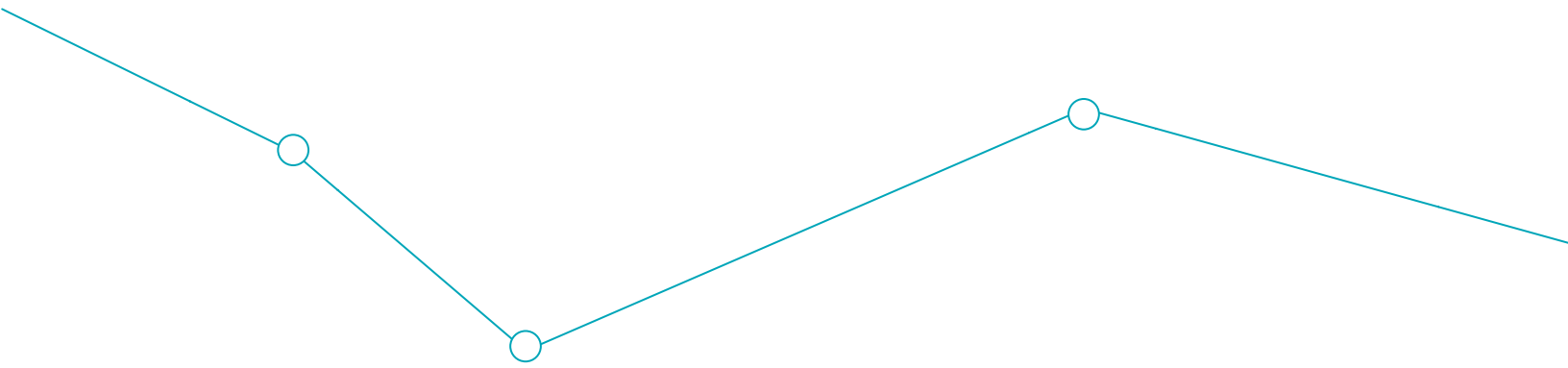
Asset recycling

Certain assets that a government owns might not be producing as much value today as they could if the government managed them differently. Instead of owning an asset outright, the government might do better to sell it (in full or in part), use it to securitize revenue, swap it for a different asset, or contract with a private partner to operate the asset. Although governments often hold on to assets to make sure they can operate them as desired, a good contractual arrangement with a public sector partner can achieve the same goal. A government may also find that it has only limited use for some of the assets in its portfolio, while private sector partners could derive a lot more value from those assets.

Unlocking this value could assist in funding some future infrastructure programs. Methods of doing so include:

Asset sale/Privatization	The government sells assets and then either devotes the revenue to a specific purpose, such as infrastructure development, or adds it to the general fund. Recent asset sales in Canada have generated funds for new infrastructure projects.
Sale and leaseback	The government can sell the asset and receive the capital payment while also securing use of the asset for the long term. The choice of this strategy depends on the net present value of rental payments versus the capital payment received on sale. Australia has typically utilized a long-term lease model rather than a sale/privatization.
Joint venture	In a joint venture, a public sector partner and a private sector partner agree to complete a project. The public partner might have an asset available to develop that would benefit from public sector involvement, to benefit from efficiencies and/or scale. Benefits to the public sector from a joint venture generally come in the form of developed assets and/or shared returns.
Assets swap	The government might own assets that are attractive to a private sector entity, and vice versa. In this case, it may be beneficial to swap the assets, perhaps in return for developing infrastructure.
Revenue securitization	In securitization, the government gives up its right to future income streams in return for a cash payment. This arrangement works well when government officials are unwilling or unable to sell the asset itself. Securitizing the asset allows the government to sell its right to the future revenue stream for a defined period of time (typically 20 to 50 years).

Whichever recycling method a government uses, it will need to follow its usual procurement procedures and project evaluation process. The fact that these opportunities will draw interest mainly from local entities should simplify the procurement.



Case study – Victorian Prisons (UK) – Selling aging prisons to fund new correctional homes

Overview

- The UK government is relocating 10,000 inmates and selling the aging prison sites to fund 9 new correctional facilities and make land available for 3,000 new homes.

Asset recycled

- Revenue from the asset sale will be utilized to construct nine new prisons across England and Wales.
- Lower operational costs at these modern facilities is expected to save the government £80 million per year.

Outcome

- This strategy will also make property available for building approximately 3,000 new homes in London, improving streetscapes and creating opportunity for Londoners to own a home that is well serviced by amenities.

Case study – Upgrade of Circular Quay wharves (Australia) through divestment of selected assets

Overview

- The New South Wales Government is upgrading Sydney's iconic Circular Quay wharves. The funds will be generated by divesting selected assets, currently held by the Sydney Harbour Foreshore Authority (SHFA), deemed to be not of long-term strategic importance.
- Offices estimate that divestment of commercial assets will generate AU $200 million in funding for the NSW Government's infrastructure fund, Restart NSW.

Asset recycled

- The funds will be generated by the divestment of some select assets (offices) currently held by the SHFA and deemed not to be of long-term strategic importance.

Outcome

- A range of options would be considered for Circular Quay, including upgrades to the ferry wharves to make them modern and accessible, all the way through to a complete revamp that could include long-term wharves with new retail facilities.

Case study – Ontario Ministry sells waterfront lands on Queen's Quay to fund transportation infrastructure

Overview

- The government of Ontario owned assets along the Toronto waterfront it deemed to be surplus.

Asset recycled

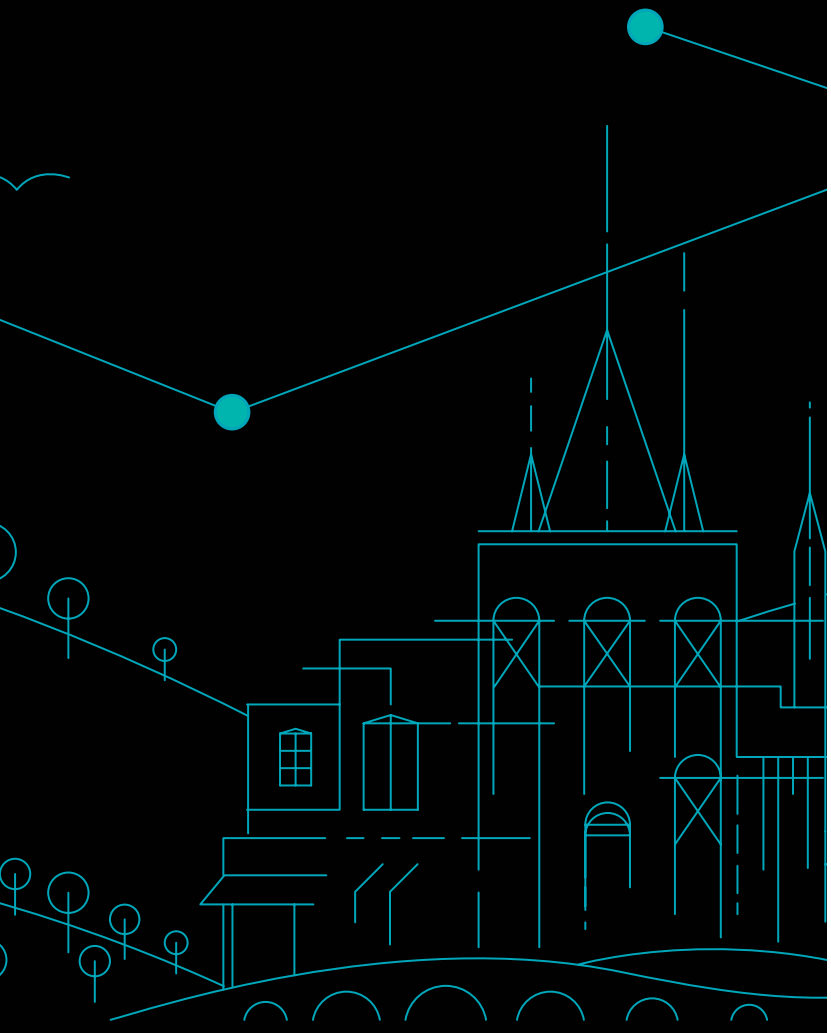
- Ontario Ministry of Finance sold these lands, on Queen's Quay, to a partnership of private developers for $260 million.

Outcome

- As part of the agreement, the private sector partners will work with the city of Toronto to develop affordable housing, public spaces, heritage conservation, and high-rise office buildings, including a new office for the Liquor Control Board of Ontario.
- The province is using the proceeds from the sale for transportation and infrastructure projects.[2]

Consider funding and financing options

Match project with appropriate financing



Introduction

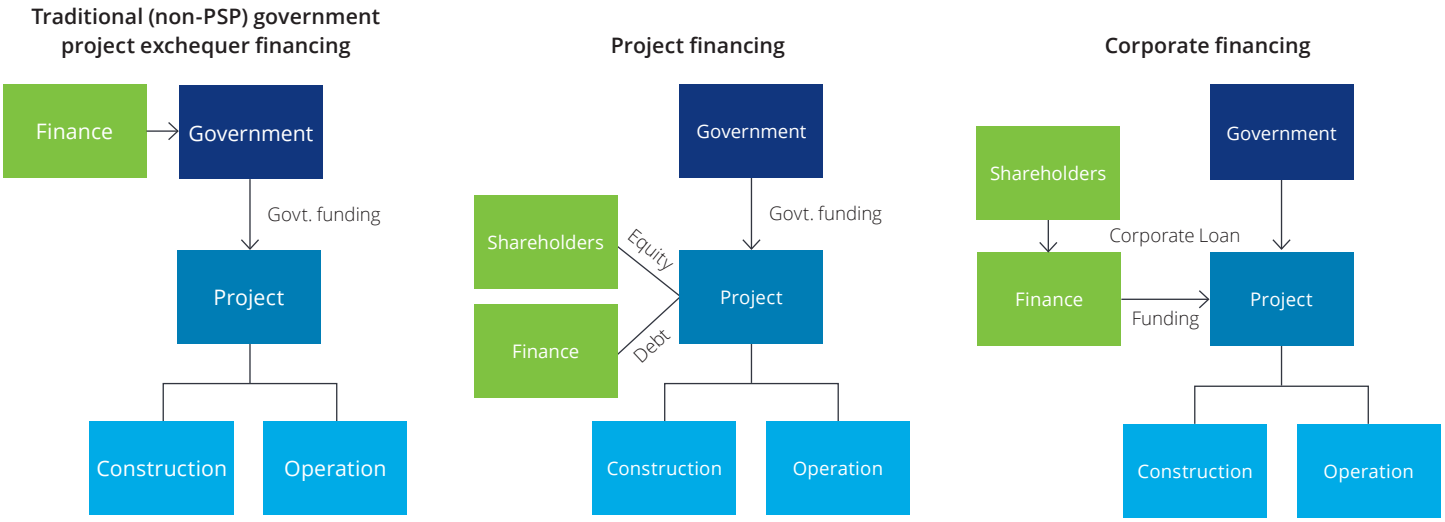
Once a government has defined the parameters of an infrastructure project and defined the business model (particularly the revenue model), including the risks involved and the potential for value capture, it is time to consider potential sources of financing (see figure 1). If the government already has funding for the project, this step will not be necessary. Instead, as the government moves on to the procurement stage, it will focus on enhancing value for money and managing risks. But the government may still seek to raise external capital, adding to overall government funds that can be used to fund projects.

The financing available to a project depends on a variety of issues, including value, sector, risk, returns available, how long funding is required, viability of the project, and geography (country risks). How much cash flow will be available for financing payments is determined mainly by the ability to repay and the associated risk.

This section considers the types of financing available for infrastructure projects, either directly or indirectly through exchequer financing. As with all financing, the funding available for infrastructure projects comes from a variety of sources, including exchequer funds, grants, debt, equity, and hybrid debt/equity instruments. This finance can be provided directly to the project (project financing) or to the government (exchequer financing) or corporations (corporate financing) supporting the project. The different structures will depend on the recourse being provided against the finance. Typically, government is required to support finance raised for government projects, such as municipal bonds. Similarly, corporate financing generally has recourse to the parent corporation.

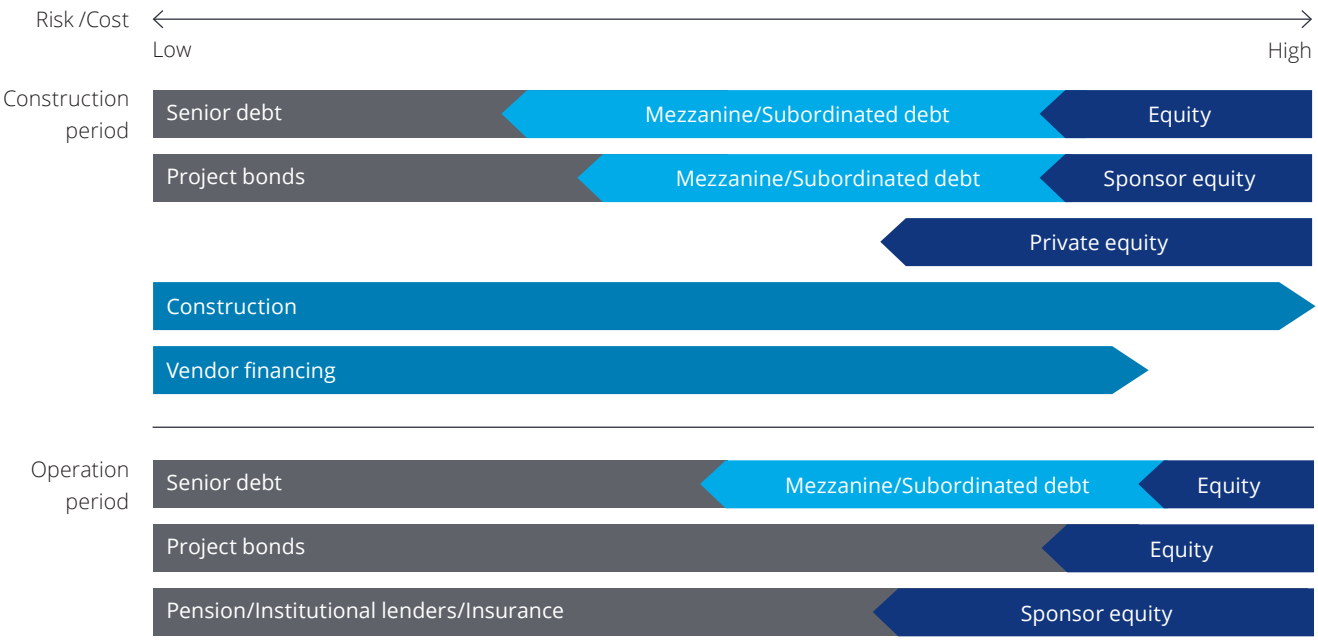
Under project financing, the parties seek to limit recourse for the finance to the cash flows of the project, in order to limit the exposure of the government or corporate shareholders to any losses. This requires the finance structure in the project to be robust and reinforced by various financial supports such as reserve accounts.

Figure 1. Financing options



In general, however, infrastructure finance is long term and is secured to the asset cash flows rather than extended security. Figure 2 below sets out the types of finance available at different periods of the project, depending on the level of risk being assumed.

Figure 2. Types of financing over construction and operation periods



What type of financing suits the project?

Every successful project typically starts with a full understanding of the proposed work, its financial dynamics, the risks, the timing of costs and revenues, and whether the project will generate any free cash flow that can be used to service any kind of financing. The risks associated with this free cash flow, quantum, certainty, and source will help determine what type of financing the project can obtain. If the projected cash flows are insufficient to pay off loans from the private sector, it is possible to combine public and private sources of finance.

Figure 3a shows the timing for different stages of public sector funding. Presuming that the public sector is not borrowing directly into the project, the cash will be drawn down as required and no funding costs will be applied.

The diagram illustrates how funds are provided from capital and revenue budgets in the public sector to fund costs as they are incurred. By involving the public sector, and using some of the available financing options, the public sector can change the timing of this spend. Managing the timing of expenditures may also reduce a project's overall cost, considering the time value of money (net present value of future cash flows) and the opportunity to develop more projects. The public sector can use its limited budget on multiple projects immediately, repaying against those projects over time. By carrying out more construction and speeding up the development of needed infrastructure, the government can produce greater economic benefit, which helps to offset costs. While the government could achieve similar aims by borrowing to increase available funds, the involvement of (see figure 3b) can help to control costs, since debt and equity financiers impose more monitoring and control mechanisms than the government would do on its own.

As we noted previously, construction and operating costs generally fall out along the same timeline as in the public sector. The difference lies in how risks and costs are managed and how they are financed.

Typically, the private sector will finance projects with a mix of debt and equity. The relative split depends on how much risk the investor perceives in the project cash flows and the construction complexity. In some cases, the private sector can use subordinated debt, which is treated as a loan but is more like equity in terms of risk profile and is repaid after senior debt is repaid. The cost of capital is usually based on the level of risk, making senior debt less expensive for the borrower than subordinated debt and equity. From a cost perspective, maximizing senior debt provides the optimum solution. The levels of senior debt available vary from lower risk PPP deals, where up to 90 percent senior debt (as a percentage of capital costs) is available, to property development, where 50–60 percent senior debt may be available.

Figure 3a. Public sector funding – cash-flow timing

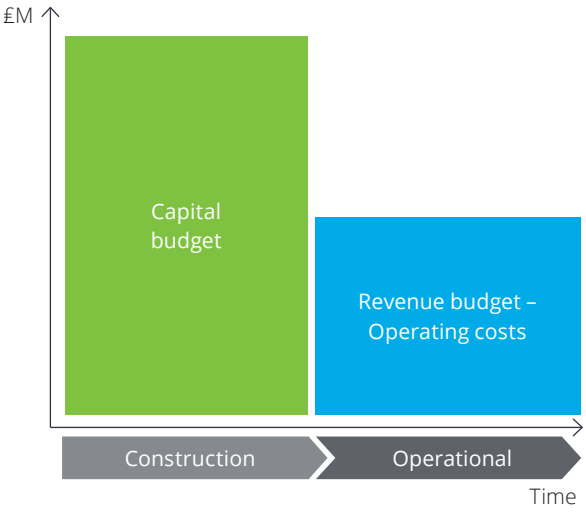
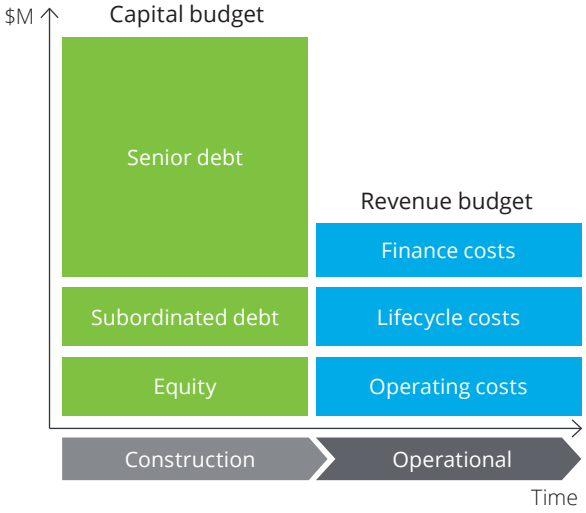


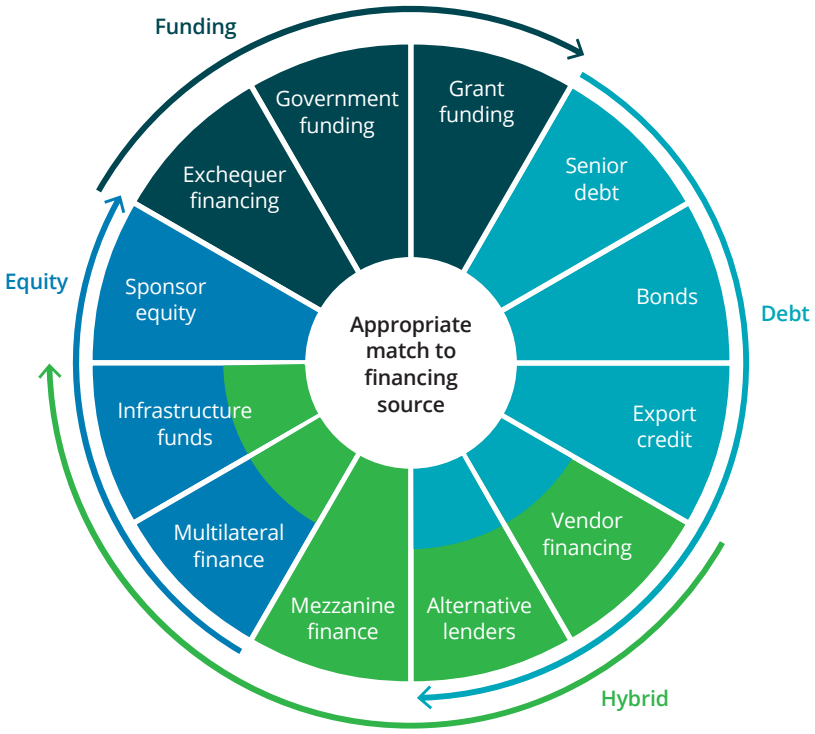
Figure 3b. Private sector funding – cash-flow timing



Types of finance/funding

Financing can be classified into debt, equity, and quasi-equity, depending on the associated risk, costs, and methods of repayment (see figure 4). The types of finance and funding used will depend on the free cash flows available, risks involved, and returns available. In general, the higher the risk assured, the higher the cost (return) sought. The type of financing utilized should be matched with the appropriate project. Many relevant options exist within the main categories.

Figure 4. Financing classifications



Debt

When a government (or a project) borrows money to finance a project, the lender's return is limited to interest earned on the principal and repayment of the principal over time. Debt financing has several characteristics that distinguish it from equity:

- **Maturity** – All debt has a maturity date, indicating when the loan will be paid in full. Long-term debt is any debt obligation with a term greater than one year. Short-term debt is a loan for one year or less.
- **Repayment provision** – Every debt instrument comes with a provision that specifies how and when the interest and principal will be paid. Some lenders may provide a grace period, allowing the borrower to postpone payments until the project has achieved positive cash flow.
- **Seniority** – Although the returns for debt holders are limited to interest on the loan, a loan confers a significant advantage—a senior claim to income and assets of the company or project. Different debt holders have different levels of rights. When a borrower has trouble making payments, general or senior creditors have first claim on the money. Only after they are satisfied do subordinated debt holders receive payment. Details about which senior lenders take priority vary from one loan agreement to another.
- **Security** – One of the terms that parties establish in a debt agreement is whether the debt will be issued on a secured or unsecured basis. In project financing, borrowers rarely put up any security beyond the cash flows and assets of the project in question.
- **Floating versus fixed rates** – The interest on a debt instrument is defined at either a fixed rate or a floating rate. A floating rate might be stated, for example, as 100 basis points, or 1 percent, above an indicator such as a bank's prime rate or the London Interbank Offered Rate (LIBOR). The interest rate fluctuates along with the indicator. A fixed rate is set for the term of the loan, based on prevailing rates for similar loans. In reality, all loans start off with floating rates. They are eventually fixed by utilizing interest-rate swaps to convert to the fixed rate.
- **Voting rights** – Unlike equity holders, lenders are not owners and therefore do not have any voting powers. However, they do have various contractual powers as agreed in advance.

Equity

Common equity financing is long-term capital provided by an investor in exchange for shares, representing ownership in the company or project. A key difference between equity and debt is the holder's claim to assets. Equity holders receive dividends and capital gains, based on net earnings that are distributed only after all debt holders have been paid. In the event of default, debt holders have first claim on income and assets. But equity holders have unlimited potential returns, while debt holders gain only interest on the debt. Equity capital can come from project sponsors, government, third-party private investors, or internally generated cash.

Quasi-equity products (hybrid financing solutions)

Some financial instruments are called "quasi" or "hybrid" instruments because they have traits of both debt and equity. Quasi instruments include subordinated convertible debt, mezzanine financing, and yield-based preferred shares. They are often structured with warrants or options. Investors who use quasi-financing instruments often have a claim to assets that is ranked between the claims held by traditional lenders and equity investors.

Quasi instruments are an attractive alternative to traditional equity or debt financing for a number of reasons. First, they do not require sponsors to relinquish any control or voting rights, as sponsors would if they issued common shares. Second, in exchange for giving investors a higher claim to assets than traditional equity investors receive, sponsors pay less for quasi-equity capital than they would for traditional equity. Third, this type of financing provides greater flexibility, as it does not have the same restrictive covenants as traditional debt financing.

Forms of quasi-financing include:

a. **Preferred shares:** Preferred shares are technically equity securities, but they possess some characteristics similar to debt and can therefore be labeled quasi debt. Preferred shares provide a fixed rate dividend, similar to the interest received from a debt instrument. But dividend payments ultimately come at the discretion of management, and failure to pay dividends will not force a company into default. However, dividends to preferred shareholders must be paid before any distributions to holders of common shares. Also, nearly all preferred share issues include a stipulation that any missed dividend payments to preferred shareholders be cumulative and must be paid in full before other payments to shareholders. In case of default, holders of preferred shares are junior to debt holders, but senior to ordinary equity shareholders.

b. **Mezzanine financing:** This form of quasi capital is placed between equity and debt in the capital structure of a project. Mezzanine financing can range in value from $5 million to $100 million, with a maturity of two to five years. Mezzanine debt is subordinate to senior debt and is considered a quasi-debt/equity instrument as it may have features that enable it to be converted to equity.

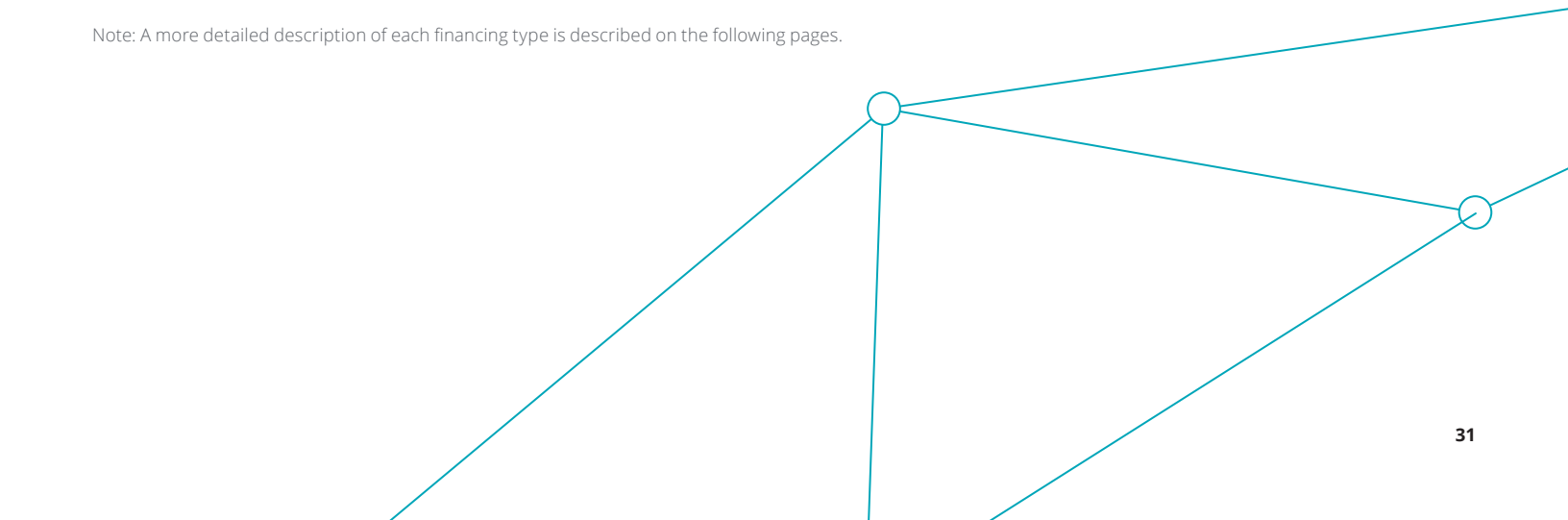
Characteristics of various types of financing

The table below sets out the characteristics of the various types of financing available.

Type of finance	Available to	Short term vs. long term	Cost	Sectors	Complexity	Geography	Potential scale $M
Municipal bonds	Government	Medium to long term	Low-medium	Transport, schools, airports and seaports	Low	Used globally, but mainly in the US	200–billions
Dim sum/ Panda bonds	Corporate/ government	Long term	Low-medium	Corporate finance	Medium	China	200–billions
Qualified public infrastructure bonds	Government focused	Long term	Low-medium	Public Infrastructure	Medium	US	200–billions
Industrial revenue bond	Corporate/ government	Medium to long term	Low-medium	Airports/ sewage facilities	High	US	100–500
TIFIA loans	Government	Medium to long term	Low	All infrastructure	Low	US	
Tax increment financing	Corporate	Medium term	Low-medium	Construction	Medium	US	
Debt							
Institutional investors (incl. pension funds)	Mainly corporate focused, although now entering project market	Medium to long term	Medium (High in case of equity)	All sectors – depending on experience, may only finance post-construction phase	Medium	Mainly developed countries such as Canada, the Netherlands, UK, and US	50–1,000
Senior debt – bank funding	Corporate/ project finance	Short to long term	Low-medium	All sectors	Low	Used globally, although not all banks/countries provide long-term debt products	50–2,000
Project bonds	Project focused	Long term	Low-medium	All sectors	Low	Globally used	200–2,000
Sukuk bonds	Project focused	Medium to long term	Low-medium	Renewables, social development	Low	Islamic-based countries (e.g., Middle East, Southeast Asia)	50–1,000
Export credit (ECA)	Corporate/ government	Medium to long term	High	Corporate finance/projects	Medium	Globally used	20–500
Green bonds	Corporate/project	Long term	Medium-high	Utilities/sewage facilities/ renewables	Medium	Globally used	100–2,000
Social impact bonds	Corporate/project	Long term	Low-medium	Social development	High	Globally used	0–100
Hybrid Financing Products							

Type of Finance	Available to	Short term vs long term	Cost	Sectors	Complexity	Geography	Potential scale $m
International nongovernmental organizations	Project/ corporate/ government	Long term	Low-medium	Social development	High	Emerging/ Underdeveloped countries – capital being provided by developed countries (e.g., EU/EIB, World Bank, USAID)	20–500
Multilateral financing	Project/ corporate/ government	Short to long term	Low-medium	All sectors	Medium	Developing countries	50–1,000
Mezzanine/ subordinated debt	Corporate/project	Short to long term	Medium	All sectors	Medium	Globally used	20–500
Vendor finance	Project/corporate	Short/ Medium term	Low-medium	Energy/ technology	Medium	Globally used	0–200
Alternative lenders	Project/corporate	Short/ Medium term	Medium-high	All sectors	High	Developed markets	25–500
Equity							
Contractors (e.g., construction firms and operators)	Project	Medium to long term	High	All sectors	Low	All countries	5–10% of equity
Infrastructure funds	Project	Medium to long term	High	All sectors	Medium	Developing countries	50–1,000
Sovereign wealth funds	Project	Medium to long term	High	All sectors	Medium	All countries	100–1,000
Crowdfunding	Corporate focused	Long term	High	Social development, technological infrastructure	High	Mainly North America and Europe	

Note: A more detailed description of each financing type is described on the following pages.



Government funding/financing

Infrastructure projects have traditionally been financed directly and completely by government. Since the late 1990s, however, the private sector has also been involved in funding and financing these initiatives. This has been done directly with finance to governments, mainly via bonds, equity capital, and bank loans of various types, and also indirectly via project or commercial financing utilizing sources of finance described in the table above.

Governments tend to have finite cash budgets on an annual basis. If the government is willing to accept the various risks associated with projects and expenditures, using direct finance can provide a cost advantage. This is because lenders (banks, institutions, and capital markets) are generally willing to lend to government at cheaper rates, as sovereign (or government) risk is considered lower than project risk. Of course, each country has different ratings and country risks, which affect pricing.

Municipal/Infrastructure bonds

Traditionally, governments have financed infrastructure projects with their own funds. But in recent years, due to public deficits, increased public debt-to-GDP ratios and, at times, the government's inability to invest efficiently, the level of public funds allocated to infrastructure in many countries has dropped significantly.

One common alternative to using taxpayer dollars is to issue bonds. In certain jurisdictions, these bonds can be raised by government without being included in the public debt calculation. This balance sheet treatment can vary by jurisdiction and type of bond. In the United States, where municipal bonds are popular, state and local governments have used them to finance infrastructure for nearly two centuries. Earnings on those investments have been exempt from federal income tax since the United States first enacted that tax in 1913. Interest earned on municipal bonds is exempt from federal taxes, and from state taxes in the state where the bonds are issued, making them an attractive opportunity for individual investors. Access to such financing for projects exclusively owned and operated by state and local governments often discourages those governments from seeking private equity financing. Individuals, either directly or through mutual funds, hold approximately 70 percent of the bond market. Municipal bonds are scalable, and the maturity period may extend up to 20 years.

US Municipal Bond

Case study – National Highways Authority of India (NHAI) and Indian Railway Finance Corporation (IRFC) to raise INR 24,000 crore through bonds

In [year?], the National Highways Authority of India (NHAI) received government approval to raise INR 24,000 crore in 2016 by issuing bonds to fund road projects. The bonds will pay 7.39–7.60 percent interest, with 10–15 year maturities. An investor must buy at least five bonds worth INR 5,000. Retail investors can purchase up to 40 percent of the total issue size, while qualified institutional buyers, companies, and high-net-worth individuals are allowed 20 percent each. The first tranche of INR 4,532 crore received bids worth INR 10,000 crore.

Case study – Kenya issues 12-year infrastructure bond worth $224 million for airport expansion

In 2014, Kenya issued a 12-year infrastructure bond worth $224 million, partly to fund expansion of the Jomo Kenyatta International Airport. The expansion was needed because traffic through the airport was expected to increase from current levels of 7 million per year to more than 30 million. The bond has an 11 percent coupon at the fixed yield rate of 11.556 percent. All three tranches of the bond were oversubscribed.

Other examples of bonds that can be used by governments (and in some cases, corporations) include what are known as panda bonds and dim sum bonds. These involve raising capital in Chinese currency (RMB) internally and externally from Chinese investors. While these are not specifically infrastructure financing sources, in certain circumstances, money from the bonds has been raised to pay (or fund payments to) Chinese contractors for infrastructure projects. For the Chinese contractors, this allow monies to be raised and eliminates exchange risk, while the government (or corporation) benefits from lower Chinese lending rates.

Qualified public infrastructure bonds (QPIBs)

QPIBs are an innovative development within the public infrastructure bond markets in the United States. In January 2015, the US government proposed this new class of municipal bonds to spur private investment in infrastructure. QPIBs would extend the benefits of municipal bond finance to PPPs, providing supportive financing for transportation, airport, port, sewer, and water projects. The bonds open new channels of financing to PPPs and can help reduce the cost of financing. To be eligible for QPIBs, projects must be owned by state or local governments and be available for general public use.

The US government proposed that the QPIB program would not expire, there would be no caps on the number of such bonds that could be issued, and these bonds would not be subject to alternative minimum tax (AMT). The overall impact of QPIBs would be to allow PPPs, including partnerships involving long-term leases and management contracts, to take advantage of the benefits of municipal bonds.

Industrial revenue bonds

Industrial revenue bonds (IRBs) may be issued by municipal jurisdictions or state governments. Most often, a local jurisdiction issues them as part of an economic development initiative, giving the proceeds to a private firm to use for development projects such as capital improvements, expansions, facility enhancements, energy upgrades, or implementing renewable energy technologies.

The jurisdiction holds the developed asset as collateral until the private partner repays the debt. Because of that, there is often no property tax on the asset, providing significant savings for the private firm. Local governments often use those savings to encourage businesses to expand or relocate in their jurisdictions, with help from IRB deals.

Because the firm, rather than the city, is ultimately responsible for paying back the debt, this debt does not influence the city's ratings.

Case study – Brookhaven uses IDB to support affordable senior housing

In 2013, the town of Brookhaven, New York, announced that its Industrial Development Agency (IDA) had approved up to $44 million in bond financing for BK at Lake Grove, LLC, which would build a 120,000 square-foot, 136-unit assisted living facility for senior citizens. The project qualified for tax-exempt IRB financing because at least 20 percent of the units would be affordable housing, designated for people who earn less than 50 percent of the area's median income. The project was designed to assist aging residents who can no longer live alone, and who want to continue living close to their families.

TIFIA loans

The Transportation Infrastructure Finance and Innovation Act (TIFIA) program provides credit assistance for qualified projects of regional and national significance in the United States. Many large-scale surface transportation projects—highway, transit, railroad, intermodal freight, and port access—are eligible for assistance. Eligible applicants include state and local governments, transit agencies, railroad companies, special authorities, special districts, and private entities. The TIFIA credit program is designed to fill market gaps and leverage substantial private co-investment by providing supplemental and subordinate capital. This type of finance fulfills a similar role to some of the supports and mechanisms available from some of the multilateral agencies (World Bank, EU) for qualifying countries and projects outside the United States.

The program's fundamental goal is to leverage federal funds by attracting substantial private and other non-federal co-investment in critical improvements to the nation's surface transportation system. TIFIA was created because state and local governments that sought to finance large-scale transportation projects with tolls and other forms of user-backed revenue often had difficulty obtaining financing at reasonable rates, due to the uncertainties associated with these revenue streams. Tolls and other project-based revenues are difficult to predict, particularly for new facilities. Although tolls can become a predictable revenue source over the long term, it is hard to estimate how many road users will pay tolls, particularly during the initial ramp-up years after construction of a new facility. Innovative revenue sources, such as proceeds from tax increment financing, also are difficult to predict. TIFIA credit assistance is often available on more advantageous terms than assistance in the financial market, making it possible for needed projects to find financing when they might not otherwise.

The TIFIA credit program offers three distinct types of financial assistance designed to address the varying requirements of projects throughout their life cycles:

Secured (direct) loan – Offers flexible repayment terms and provides combined construction and permanent financing of capital costs. The maximum term on this loan is 35 years from substantial completion. Repayments can start up to five years after substantial completion to allow time for facility construction and ramp-up.

Loan guarantee – The federal government guarantees a borrower's repayments to a non-federal lender. Loan repayments to the lender must commence no later than five years after substantial completion of the project.

Standby line of credit – Represents a secondary source of funding in the form of a contingent federal loan to supplement project revenues, if needed, during the first 10 years of project operations. This is available up to 10 years after substantial completion of the project.

The amount of federal credit assistance may not exceed 33 percent of reasonably anticipated, eligible project costs. The exact terms for each loan are negotiated between the US Department of Transportation (USDOT) and the borrower, based on the project economics, the cost and revenue profile of the project, and any other relevant factors. For example, USDOT policy does not generally permit equity investors to receive project returns unless the borrower is current on TIFIA interest payments. TIFIA interest rates are equivalent to Treasury rates. Depending on market conditions, these rates are often lower than what most borrowers can obtain in the private markets. Unlike private commercial loans with variable rate debt, TIFIA interest rates are fixed. Overall, borrowers benefit from improved access to capital markets. They also gain the chance to accelerate completion of large-scale, capital-intensive projects that otherwise might be delayed or not built at all, because they are so large and complex and the market is uncertain about the timing of revenues.

Tax increment financing

Tax increment financing (TIF) is a public financing method that is used as a subsidy for redevelopment, infrastructure, and other community-improvement projects in many countries, including the United States. Similar or related value capture strategies are used around the world. Through the use of TIF, municipalities typically divert future property tax revenue increases from a defined area or district toward an economic development project or public improvement project in the community.

The first TIF was used in California in 1952. By 2004, all 50 American states had authorized the use of TIF. The first TIF in Canada was used in 2007. While TIFs are growing increasingly popular elsewhere in the world, in 2011, California—which started the trend—enacted legislation to eliminate the state's nearly 400 redevelopment agencies (RDAs), which implemented TIFs. This move, a response to California's Fiscal 2010 Emergency Proclamation, stopped the diversion of property tax revenues from public funding. The RDAs are appealing this decision. TIF subsidies are not appropriated directly from a city's budget, but the city incurs loss through foregone tax revenue. In certain countries, where tax relief has been provided to encourage development and investment, public opinion has turned against the use of TIF.

Debt products

Senior debt – bank funding

Senior debt is provided in the form of a loan, generally from banks. It is the first level of a project's liabilities, which means it is paid back first, ahead of all other creditors. Senior debt, as opposed to junior debt, is first in seniority and is often secured by collateral in the form of a lien.

Senior debt is among the safest forms of financing for the party providing the funds. Due to its inherent low risk, it also typically provides the least amount of return. However, in exchange for this low return, significant protection is provided even in the event of bankruptcy. Should a company/project go bankrupt, any remaining funds, dissolved assets, or other available sources of value must be used to repay senior debt before other creditors are able to collect. Other protections such as covenants, minimum cover ratios, reserve accounts, and step-in rights, help to avoid insolvency solutions. However, such protection exists in the case of bankruptcy.

Senior debt is financing lent to a project/company for a pre-negotiated period of time with interest paid on the principal. The lender profits from this arrangement due to the scheduled period of borrowing on which the interest applies. The risk is low because the borrower is contractually obligated to make payments on a pre-determined schedule. The lender does not gain the benefit of a higher potential return because the financing and its recoupment are not based on the borrower's financial performance. For this reason, senior debt is often prioritized over other investments and creditors.

The main bank senior debt providers by region in 2017 were as follows, based on the value of their lending to greenfield projects:

Global	Africa	Asia	Australasia
• Sumitomo Mitsui Banking Corporation (SMBC)	• Sumitomo Mitsui Banking Corporation (SMBC)	• Mizuho Bank	• Clean Energy Finance Corporation (CEFC)
• Mitsubishi UFJ Financial Group (MUFG & BTMU)	• Sumitomo Mitsui Trust Bank (SMTB)	• Siam Commercial Bank (SCB)	• Westpac Banking Corp
• Mizuho Bank	• Mizuho Bank	• Sumitomo Mitsui Banking Corporation (SMBC)	• Australia and New Zealand Banking Group (ANZ)
• Santander	• Asian Infrastructure Investment Bank (AIIB)	• Mitsubishi UFJ Financial Group (MUFG & BTMU)	• Mizuho Bank
• Norddeutsche Landesbank Girozentrale (NORD/LB)	• Societe Generale (SocGen)	• Sumitomo Mitsui Trust Bank (SMTB)	• Commonwealth Bank of Australia (CBA)
• Credit Agricole CIB	• Mitsubishi UFJ Financial Group (MUFG & BTMU)	• Resona Bank Limited	• Sumitomo Mitsui Banking Corporation (SMBC)
• ING Group (ING)	• Nippon Life Insurance Company	• Oversea-Chinese Banking Corporation (OCBC)	• Bank of China (BOC)
• Siam Commercial Bank (SCB)	• Standard Chartered Bank PLC	• Toho Bank	• Credit Agricole CIB
• Natixis	• Standard Bank Group	• The 77 Bank	• Societe Generale (SocGen)
• KfW IPEX-Bank GmbH (KfW)	• Investec	• DBS Bank	• Industrial and Commercial Bank of China (ICBC)
• Societe Generale (SocGen)	• Barclays	• Habib Bank	• Mitsubishi UFJ Financial Group (MUFG & BTMU)
• Rabobank Group (Rabobank)	• Rand Merchant Bank (RMB)	• Silk Road Fund	• National Australia Bank (NAB)
• HSH Nordbank AG		• ING Group (ING)	• KfW IPEX-Bank GmbH (KfW)
• Sumitomo Mitsui Trust Bank (SMTB)		• KDB Asset Management (KIAMCO)	• Natixis
• Commonwealth Bank of Australia (CBA)		• Korea National Pension Service (NPS)	• Canadian Imperial Bank of Commerce (CIBC)

Europe	LATAM	Middle East	North America
• Norddeutsche Landesbank Girozentrale (NORD/LB)	• Santander	• Sumitomo Mitsui Banking Corporation (SMBC)	• Sumitomo Mitsui Banking Corporation (SMBC)
• HSH Nordbank AG	• Sumitomo Mitsui Banking Corporation (SMBC)	• Mitsubishi UFJ Financial Group (MUFG & BTMU)	• Mitsubishi UFJ Financial Group (MUFG & BTMU)
• Sumitomo Mitsui Banking Corporation (SMBC)	• Huawei	• Natixis	• CIT Bank NA
• ING Group (ING)	• Nokia	• National Commercial Bank	• Rabobank Group (Rabobank)
• Mitsubishi UFJ Financial Group (MUFG & BTMU)	• Mizuho Bank	• Siemens Financial Services	• Santander
• Credit Agricole CIB	• Financiera de Desarrollo Nacional (FDN) - Colombian development bank	• Credit Agricole CIB	• Bank of America Merrill Lynch (BAML)
• Cassa Depositi e Prestiti (CDP)	• Banco Bradesco	• Norinchukin Bank	• Citigroup
• KfW IPEX-Bank GmbH	• Citigroup	• First Abu Dhabi Bank	• ING Group (ING)
• (KfW)	• Banorte	• BNP Paribas	• Credit Agricole CIB
• Rabobank Group (Rabobank)	• National Commercial Bank (NCB) Jamaica	• Arab Petroleum Investments Corporation (APICORP)	• Morgan Stanley
• Natixis	• KfW IPEX-Bank GmbH (KfW)	• Union National Bank	• BNP Paribas
• Aviva	• Credit Agricole CIB	• Commonwealth Bank of Australia (CBA)	• GE Energy Financial Services
• UniCredit Group	• Banco do Nordeste do Brasil (BNB)	• Norddeutsche Landesbank Girozentrale (NORD/LB)	• Mizuho Bank
• Santander	• Natixis	• National Australia Bank (NAB)	• Industrial Bank of Korea (IBK)
• Banco BPM	• Banco de Bogotá	• Caixabank	• Royal Bank of Canada (RBC)
• Intesa Sanpaolo			

Sukuk bonds

Sukuk are a class of investments designed to comply with Sharia law. They are not true interest-bearing instruments, but rather are structured to channel rents, changes in capital gains/losses, or income to investors in periodic payments.

Sukuk may be issued by governments, multilateral development banks (MDBs), or private entities such as corporations. Possible structures include project finance sukuk, asset-backed sukuk, sale/leaseback structures, or rent/income pass-throughs.

Because Sharia-compliant financial instruments are generally backed by assets, sukuks are well suited to infrastructure investment. The underlying principle of such instruments is sharing risk and return among the parties to a transaction. Cash flows and returns to investors are linked to the performance of the asset.

Case study – Luxembourg issues sukuk bonds

Luxembourg's Parliament issued the first Luxembourg sovereign sukuk in response to the recent surge in investor demand for Sharia-compliant instruments. A special purpose vehicle (SPV) is owned by the Luxembourg state for the purpose of issuing sovereign sukuk with a value of €200 million. Issuing sukuks would help Luxembourg to diversify its status as a financial center and develop new skills, differentiating it from other European financial hubs.

Luxembourg sovereign sukuks are set up according to the Al-Ijara structure, the most common structure for sovereign sukuks, with rental payments on property providing income for the investors. Thus far, Luxembourg has securitized three government properties—the two towers of the Gate of Europe in Kirchberg and the Gutenberg building in Strassen—to back sukuks worth €200 million.

Case study – Senegal issuing second sovereign sukuk in 2016

Senegal has issued sukuks twice, in June 2014 and June 2016. The second issuance, worth €229 million and backed by the assets of the nation's international airport, was offered at a 6 percent return, with a 10-year maturity. Plans called for using the funds raised to finance economic and social development projects, such as improvements in the urban center of Diamniadio, a drinking water program, and a program focused on lighting for roads and streets.[3]

Infrastructure project bonds

Infrastructure project bonds are debt instruments usually issued by governments or public companies to raise funds from the capital market. Project bonds give institutional investors a chance to participate in infrastructure projects through listed, tradable securities that can offer superior, risk-adjusted returns. The advantages of these bonds include a long tenor and strong capacity to absorb a large quantum of debt; a fixed rate; and a streamlined, quick-to-market syndication process after documents are finalized.

Case study – Castor underground natural gas storage project (UGS Project), Spain

Watercraft Capital S.A. was formed [when?] to issue €1.4 billion worth of project bonds, in order to support [construction of an underground storage facility for natural gas? Where?] The principal goal was to raise money in the capital markets and lend it to Escal UGS, the project sponsor, through an on-loan agreement. The bond matures in 2034 and has an annual coupon rate of 5.756 percent.

The successful financial close demonstrated that bond credit enhancement can support long-term investment in periods of economic turmoil and in difficult markets, such as Spain. Indeed, the bond issue was oversubscribed by €200 million (including the takeout of €300 million by the European Investment Bank). According to participants, the relatively rapid close of the bond issue was also achieved in part because the issue's rating was able to pierce the sovereign rating ceiling.

Over the life of the project, Watercraft Capital will on-lend the bond's proceeds to Escal (an investor in the UGS Project), which in turn will use them for the additional construction work, maintenance, and refinancing of the UGS Project.

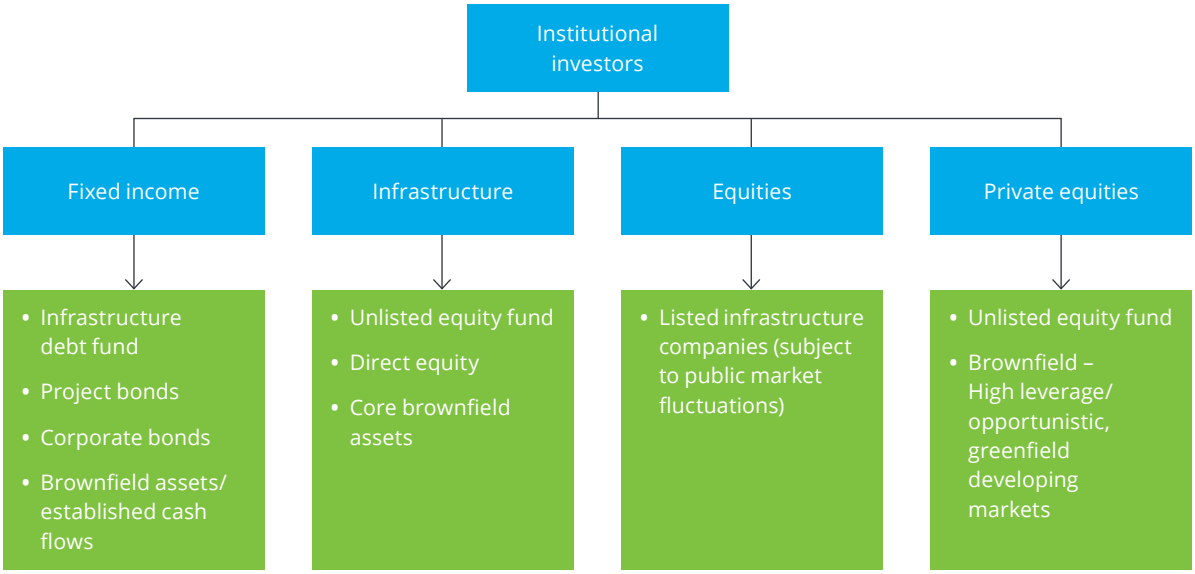
Institutional investors

Pension funds, insurance companies, and mutual funds

The investment profiles of institutional investors are particularly well-suited for infrastructure finance. They are usually seeking long-term, low-risk, fixed-income products to match the nature of their insurance, pension, or sovereign liabilities. The past five years have seen a steady rise in the number of institutional investors allocating assets to infrastructure, as well as the establishment of infrastructure as an asset class in its own right.

Australian and Canadian pension funds have been pioneers in infrastructure investing since the early 1990s. They also currently have the world's highest asset allocation to infrastructure. In the past, pension funds have been involved with infrastructure mainly through their investments in listed companies (such as utilities), or through their real estate portfolios. Today, some of the larger organizations are beginning to invest in infrastructure via private equity funds, or even directly. Depending on their policies and investment strategies, these funds can provide either debt or equity for projects. Since it takes greater project experience and capability to enter and understand/manage the higher-risk construction phase of a project than the operation phase, different funds will get involved at different points in the project life cycle. Only a small number of these institutional investors provide funding at the construction phase. These funds are also starting to acquire developed projects in significant numbers, with strong competition for any projects being sold by government (asset recycling) or by other funds/sponsors.

Figure 5. Potential investor allocation for infrastructure



Examples of pension funds investing in infrastructure:

Canada Pension Plan Investment Board
The €188 billion Canada Pension Plan Investment Board, one of the largest pension funds in the world, has an infrastructure program of about CAD 20 billion, representing about 7 percent of its portfolio.

Pan Africa Infrastructure Development Fund
South Africa's Public Investment Commission (PIC) has created a multibillion-dollar, 25-year fund to mobilize local and international investment in infrastructure development in Africa. Investors in the fund include the Government Employees Pension Fund, as well as insurance companies involved in managing pension funds, and the Ghanaian Social Security and National Insurance Trust (SSNIT) Corporation.

The Nigeria Infrastructure Fund
The Nigeria Infrastructure Fund (NIF) aims to invest in projects that contribute to the development of essential infrastructure in Nigeria.

Export Credit Agency (ECA)

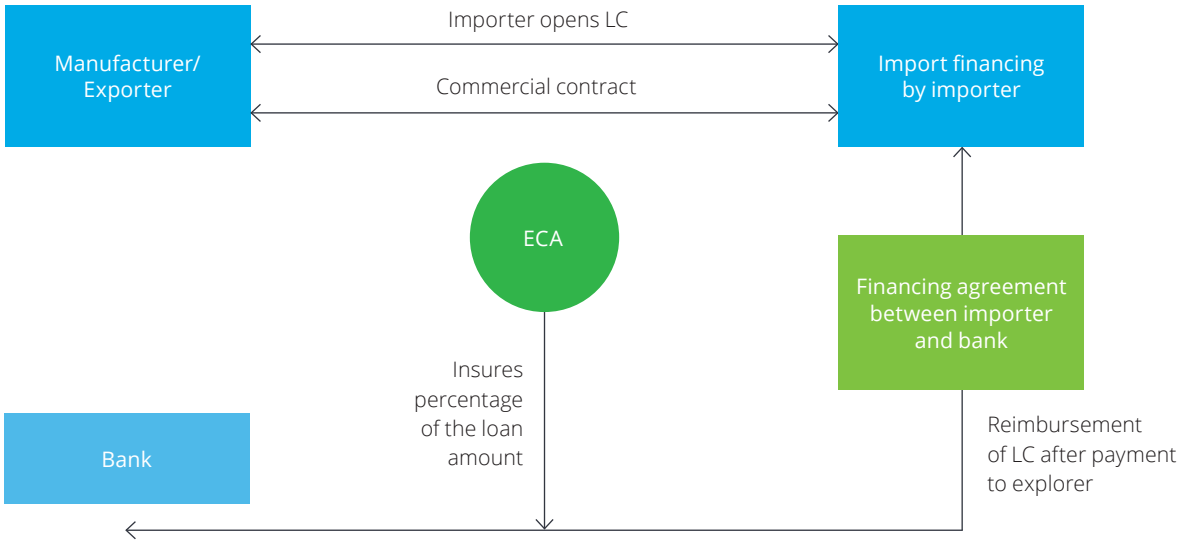
Export credit agencies and investment insurance agencies, commonly known as ECAs, are public agencies that provide government-backed loans, guarantees, credits, and insurance to corporations from their home countries (see figure 6).

ECA-backed funding has long been integral to the financing of many projects. Initially, private developers that were building projects in emerging economies needed ECA funding as protection against political risk, in order to mobilize capital at a reasonable cost. In the last 20 years, ECAs have provided a significant amount of debt financing, risk mitigation cover, and other enhancements for power generation projects globally. They have also been major catalysts for facilitating capital for large projects in more difficult markets. Examples of ECAs include USEXIM, JBIC, KSURE, and Euler Hermes.

Even where political and credit risk are not a significant concern, ECAs can bring additional debt capacity in highly rated markets. This is particularly relevant for projects with large capital requirements. Against the backdrop of the capital requirements imposed by Basel III, the lower capital charge that ECA-supported financing attracts is important for banks looking to provide debt for big projects.

ECAs have increased in number and activity across different sectors. This has encouraged the development of more competitive premiums and products for borrowers. ECAs are also taking a greater role in structured finance transactions, with some institutions offering enhanced products and innovative structures to meet increased demand in this space.

Figure 6. How an ECA model works

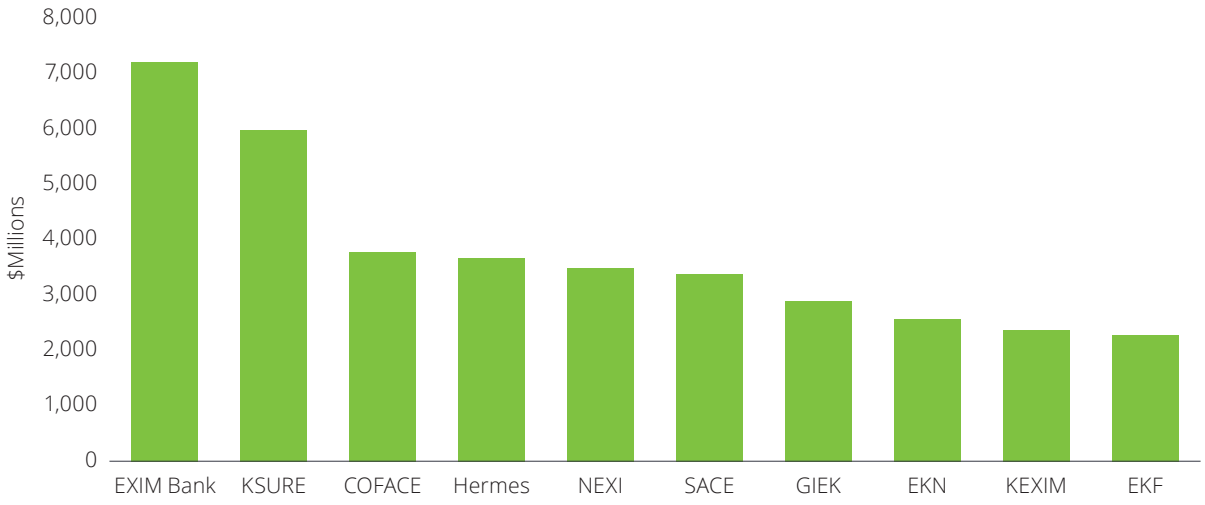


In addition, governments are providing greater scope for ECAs to offer borrowers financial products that would normally be offered by players in the private sector. For example, in a number of sectors, ECAs provide cover for letters of credit and other short tenor products, as well as guaranteeing 100 percent of working capital loans in response to growing demand.

Today, in the developing world, ECAs make up one of the largest sources of public financial support for foreign corporate involvement in industrial projects (see figure 8). Experts estimate that ECAs support twice as many oil, gas, and mining projects as do all multilateral development banks, such as the World Bank Group.

In recent years, ECAs have supported projects worth an estimated $50 billion to $70 billion annually. A great portion of those initiatives are large industrial and infrastructure projects in developing countries.

Figure 7. Top ECAs by loan guaranteed volume, 2014



Source: Citibank Report, Financing via Export and Agency Finance (ECA), 2015

Case study – German export credit agency Euler Hermes guarantees CAD 252.4M loan for Niagara Region Wind Farm

In [year], wind turbine manufacturer Enercon and the Six Nations of the Grand River Development Corporation announced the close of a non-recourse loan backing the Niagara Region Wind Farm, a CAD 950 million (USD 709 million) project in Ontario.

Located in the Regional Municipality of Niagara, the wind farm consists of 77 wind turbines and has a total capacity of 230 MW.[4]

Debt financing for the project includes an 18-year, CAD 789.5 million construction loan and a CAD 39 million letter of credit facility. Roughly CAD 252.4 million of the loan will be covered by a guarantee from German export credit agency Euler Hermes.

Case study – USD 800M ECA financing package closes Lima Metro Line 2

Peru's Ministry of Transportation and Communications and the Metro de Lima consortium announced a PPP project for Lima Metro Line 2 in [year]. This is one of the most ambitious infrastructure projects ever launched in Latin America under a concession framework. Under the 35-year concession agreement, 35 km of subway lines will be built over five years. Total investment in the project will come to approximately USD 6 billion.

The facility is covered by an export credit guarantee provided by SACE, the Italian export credit agency. This is the first RPI-CAO financing covered by an ECA and largest RPI-CAO[†] deal ever financed under a loan format in Peru. This 20-year, ECA-covered loan financing is the second building block in a USD 2.5 billion private financing package that also includes a long-term facility provided by Inter-American Development Bank, as well as a revolving construction facility.

The expansion work will help get cars off the road and encourage the use of public rail transport. This will significantly reduce environmental impacts in the conurbation of Lima.

Case study – Export credit line to Ecuadorian government will fund Japanese equipment for digital broadcasting network

In [year?], the Japan Bank for International Cooperation (JBIC) signed a loan agreement for up to $9.6 million, setting up an export credit line for the government of the Republic of Ecuador. This credit line is co-financed with Citibank Japan Ltd., with Nippon Export and Investment Insurance (NEXI) providing buyer's credit insurance for the co-financed portion.

The credit line will allow the government of Ecuador to pay Japanese companies in US dollars for broadcasting equipment for an upcoming project to build a digital broadcasting network. The state-run broadcasting company, RTV Ecuador, plans to build such networks in Quito, Guayaquil, and other cities. The export credit line will also allow Ecuador to import related equipment from Japan and expand high-quality terrestrial digital broadcasting in the country.

Green bonds

Green bonds are issued to raise capital for funding clean power, carbon-reducing projects. Green bonds offer longer maturity periods, third-party credit enhancement, and more flexible covenants. When issued by government entities, they provide tax-exempt returns and are particularly attractive to investors who appreciate the risk/return characteristics of conventional bonds. Green bonds tend to produce solid credit ratings since international financial institutions and governments are the principal issuers.

Case study – Water green bond, District of Columbia

The government of Washington, DC, had considered issuing a conventional bond to finance its Clean Rivers Project, an initiative to reduce sewer overflows into local rivers and creeks. But as government officials considered the characteristics of the assets involved and the expected environmental outcomes, they decided it was more appropriate to finance the project with green bonds. DC was the first government in the United States to use this instrument. The city had planned to issue $300 million in green bonds in July 2014, but due to strong demand, it ultimately increased that number to $350 million. The city issued a second round of green bonds in 2015.

Case study – Transport for London issued a green bond to fund low-carbon transport

Transport for London (TfL), a public-private partnership responsible for London's massive transport network, issued a £400 million ($596 million) green bond in April 2015. With a 10-year tenor and a coupon of 2.125 percent, the bond was rated AAA by Standard and Poor's. The eligible green projects in TfL's green bond framework are split into low-carbon transport categories for surface rail, the Underground, station infrastructure, low-emission hybrid buses, and cycling improvements.

[†] CAOs and RPI-CAO certificates are executed upon completion of a work advance, recognizing the portion of the RPI payment associated with the completed work advances.

TfL's green bond was a massive success with investors, oversubscribed by 50 percent, with the £400 million offering receiving orders for £600 million.

Social impact bonds

Social impact bonds (SIBs), also known as pay-for-success bonds, differ from conventional bonds in that they don't offer a fixed rate of return. Rather, the value of the capital at the bond's maturity is based on the achievement of a set of social outcomes agreed upon by the investor and the issuer.

SIBs are new, being used largely on a test basis in places such as the United Kingdom, Australia, Canada, and more recently in New York, Massachusetts, and Ohio. Creating a mechanism for financial return based on desirable improvements, they are an appealing instrument for socially oriented investors and investors interested in alternative measures of financial performance.

Case study – Essex County Council: Children at risk of going into care

Essex County Council was the first local authority in the United Kingdom to commission an SIB. In partnership with Children's Support Services Ltd, the Essex CC introduced a program to improve outcomes for young people who are at risk of going into foster care.

The SIB will allow Essex CC to provide multisystemic therapy (MST) to 380 young people and their families over an eight-year period. MST is an evidence-based program in which highly qualified therapists deliver family therapy in the home. By improving parenting and rebuilding positive family relationships, it allows families to manage future crisis situations, delivering long-term and sustained impact. The aim of the program in Essex is to divert at least 110 children from care.

Investors in the SIB, including Big Society Capital and Bridges Ventures, provided £3.1 million to Children's Support Services Ltd (CSS Ltd), a special purpose vehicle set up to manage the project. CSS Ltd provides operational funding to the service provider (Action for Children), with payments to investors coming from Essex CC when outcomes are achieved.

The SIB is expected to save Essex CC a total of £10.3 million. This figure is based on projected savings of £17.3 million gross, with a £7 million cap on outcome payments by the Council.

Hybrid financing products

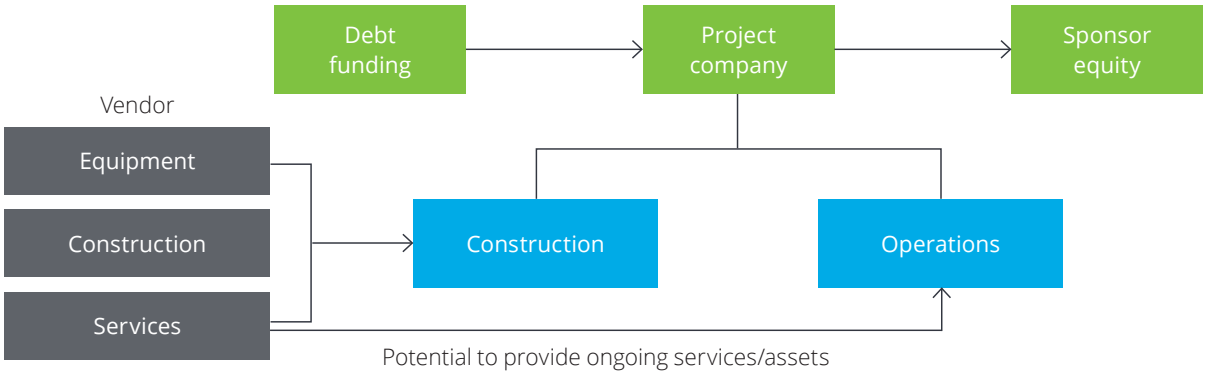
As they come under increased fiscal pressure, many governments have been committing less taxation revenue to infrastructure and relying more heavily on debt financing. That has contributed to increased net debt for governments and led to the development of new financing techniques to allow investment in infrastructure. Here's a look at some of the more popular strategies.

Vendor finance

Often, a company selling equipment to a project; an engineering, procurement, and construction (EPC) contractor; or another supplier of services will offer financing for the project. Because an equipment supplier, for example, may have a better understanding of a project's technical risks, or of the industry concerned, it might be more willing than a commercial lender to assume those risks. Vendor finance may help a supplier increase sales and open new markets.

Vendor finance may take the form of a loan (i.e., selling the equipment on credit), a lease of equipment, or even a guarantee of bank financing.

Figure 9. [Title with sentence-style casing here]



Alternative lenders

A new class of institutional funds, called alternative lenders, has entered the market in recent years. These funds provide finance throughout the capital structure (debt and equity), but they can provide significant flexibility in payment and other terms. In many cases, these funds provide money on a single unitranche structure (see figure 9a). There is often no distinction between senior and/or sub-debt; instead, a single price is placed on the overall cost of debt. Some of the potential benefits of using these funds include:

- Ability to provide more structural flexibility (covenants, headroom, cash sweep, dividends, portability, etc.)
- Access to non-amortizing, bullet structures
- Access to debt across the capital structure via senior, second lien, unitranche, mezzanine, and quasi equity
- Increased speed of execution, short credit processes, and access to decision makers
- Potentially larger hold sizes for leveraged loans (£30 million up to £300 million)
- Deal teams of funds will continue to monitor the asset over the life of the loan

Equity

Contractors equity (e.g., construction firms and operators)

This is the equity provided by the project contractors that also have a role in the project (construction, operation; see figure 9b). In many cases, the investment provided by these parties supplements financial investor equity provided by financial institutions (infra funds, institutional funds), but it is often used by these financial investors to ensure the commitment of the contractors. For structuring reasons, the equity investment may be split between pure equity (issued shares) and a debt equity instrument, which operates like debt but does not get paid until all other liabilities have been cleared. Like all equity, the capital amount and any returns are the last to be paid/repaid from the project at any given time, and all liabilities must be cleared before equity payments can be made.

The table below sets out a number of the contractors involved in recent projects around the world and their country of origin.

Figure 9a. Typical financing structure for private sector project

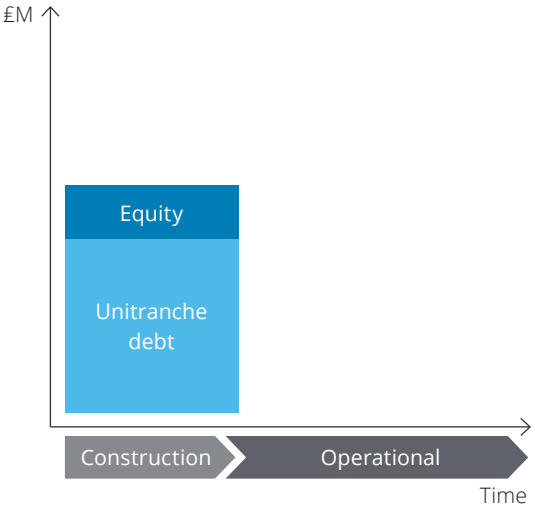
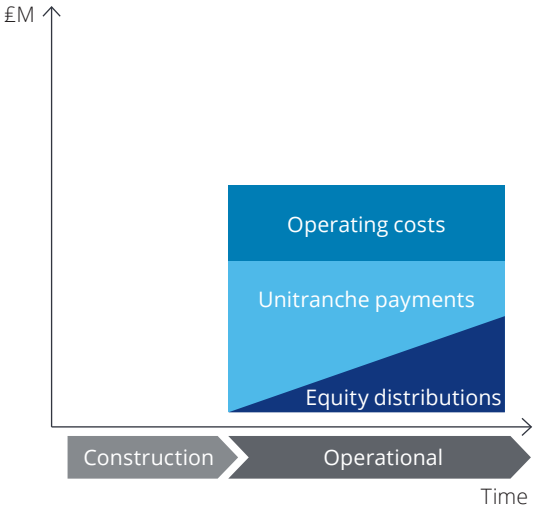


Figure 9b. Typical financing structure for private sector project



Contractor equity investors

Corporación América (CASA)	Argentina	Cheung Kong Infrastructure Holdings (CKI)	Hong Kong	Sacyr	Spain
CIMIC Group	Australia	GMR Infrastructure	India	Globalvia	Spain
Plenary (Asia-Pacific)	Australia	Shikun & Binui	Israel	Acciona	Spain
Macquarie Atlas Roads (MQA)	Australia	Atlantia	Italy	Ferrovial	Spain
Transurban Group	Australia	Astaldi Group	Italy	Itinere Infraestructuras	Spain
Strabag SE	Austria	Salini Impregilo	Italy	Grupo Isolux Corsán	Spain
PORR Group	Austria	Sumitomo Corporation	Japan	Abertis	Spain
Andrade Gutierrez Concessões	Brazil	Mitsui & Co	Japan	Skanska	Sweden
Invepar	Brazil	Marubeni	Japan	Electricity Generating Public Company Limited (EGCO)	Thailand
Odebrecht TransPort	Brazil	Mitsubishi Corporation	Japan	Akfen Holding	Turkey
Triunfo Participações e Investimentos	Brazil	IJM Corporation Berhad	Malaysia	Fulcrum Infrastructure	UK
Odebrecht Participações e Investimentos	Brazil	Promotora y Operadora de Infraestructura (PINFRA)	Mexico	Kier Project Investment	UK
Vantage Airport Group	Canada	OHL México	Mexico	Scottish and Southern Energy (SSE)	UK
Graham	Canada	Empresas ICA (Ingenieros Civiles Asociados)	Mexico	Interserve Investments	UK
Bombardier	Canada	Impulsora del Desarrollo y El Empleo en America Latina (IDEAL)	Mexico	Vinci Investments	UK
EllisDon	Canada	BAM PPP	Netherlands	Eric Wright Group	UK
AECON	Canada	Strukton	Netherlands	Sweett Group	UK
SNC-Lavalin	Canada	Heijmans	Netherlands	Galliford Try	UK
Besalco	Chile	VolkerWessels	Netherlands	John Graham	UK
A-port	Chile	Ballast Nedam	Netherlands	Costain	UK
Construcciones El Cóndor	Colombia	Graña y Montero (GyM)	Peru	Balfour Beatty	UK
Grupo Odinsa	Colombia	Ayala Corp	Philippines	Carillion	UK
Colas	France	Lineas (formerly Ascendi)	Portugal	Wates Group	UK
Eiffage	France	SDC Investimentos	Portugal	John Laing	UK
EGIS Group	France	Grupo Mota-Engil	Portugal	Kajima Partnerships	UK
Bouygues	France	Changi Airports International (CAI)	Singapore	Laing O'Rourke	UK
Transdev	France	Comsa Corporación	Spain	Miller Group	UK
Vinci	France	Grupo ACS	Spain	Morgan Sindall Investments	UK
Fraport AG	Germany	Construcciones Sarrión	Spain	Macquarie Infrastructure Corporation (MIC)	USA
AviAlliance	Germany	Obrascon Huarte Lain (OHL)	Spain	Fluor Corporation	USA
Bilfinger RE Asset Management (BREAM)	Germany	AENA	Spain	Bechtel	USA
HOCHTIEF	Germany	FCC Construcción	Spain	AECOM	USA
Siemens Project Ventures (SPV)	Germany	ROADIS	Spain		
J&P Avax	Greece	Assignia Infraestructuras	Spain		

Infrastructure funds/institutional investors

Infrastructure funds (managed by general partners or directly) are established to invest in infrastructure projects. Typically, these investments are made in the equity of the project; however, certain "debt" funds can provide the senior debt portion from their fund. Infrastructure funds have typically received investment from institutional investors (e.g., pension funds/ insurance companies) that have an interest in the infrastructure asset class but do not have the capability to assess the investment. These funds are managed by general partners who manage the investment process, sourcing and evaluating investments, and managing projects post investment.

An infrastructure fund has a defined focus on specific sectors, geography, and stage of investment (greenfield/ brownfield) for which it has approval to invest. The majority of these funds focus on developed assets (brownfield) because they are less complex than greenfield projects, which involve more construction and completion risks.

The table below sets out the largest infrastructure funds and their originating country. Most of these funds, however, make investments across the global market.

Largest infrastructure funds

Macquarie Group	Australia	InfraRed Capital Partners	UK
IFM Investors	Australia	Hermes GPE	UK
Colonial First State Global Asset Management	Australia	Actis	UK
AMP Capital	Australia	Dalmore Capital Limited	UK
Hastings	Australia	Equitix	UK
QIC Limited	Australia	iCON Infrastructure	UK
BTG Pactual	Brazil	Infracapital	UK
Brookfield Asset Management	Canada	Arcus Infrastructure Partners	UK
Axium Infrastructure	Canada	Green Investment Group	UK
Northleaf Capital Partners	Canada	Global Infrastructure Partners	USA
Ping An Asset Management	China	BlackRock	USA
China Communication Construction Company	China	EIG Global Energy Partners	USA
Sunvision Capital	China	Energy Capital Partners	USA
Copenhagen Infrastructure Partners	Denmark	KKR	USA
Antin Infrastructure Partners	France	ArcLight Capital Partners	USA
Ardian	France	Stonepeak Infrastructure Partners	USA
Meridiam Infrastructure	France	I Squared Capital	USA
InfraVia Capital Partners	France	Morgan Stanley Infrastructure	USA
Mirova Environment and Infrastructure	France	Ridgewood Energy	USA
DIF	Netherlands	LS Power Group	USA
Equis	Singapore	Goldman Sachs Infrastructure Partners	USA
KDB Infrastructure Investments	South Korea	Oaktree Capital Management	USA
EQT	Sweden	The Carlyle Group	USA
Partners Group	Switzerland	Harbert Management Corporation	USA
John Laing	UK	American Infrastructure Funds	USA
ICON Infrastructure	UK	Starwood Energy Group	USA

In addition to infrastructure funds investing in projects on behalf of institutional investors, some institutional investors have the capability and permission to invest in projects directly. These are usually developed projects (brownfield), but greenfield projects get direct investment in some cases as well.

Largest infrastructure funds

Infrastructure Institutional Investors	Australia
AustralianSuper	Australia
Future Fund	Australia
Motor Trades Association of Australia (MTAA) Superannuation Fund	Australia
Qsuper	Australia
Retail Employees' Superannuation Scheme (REST)	Australia
SunSuper	Australia
UniSuper	Australia
Victorian Funds Management Corporation (VFMC)	Brazil
Previ-Caixa de Previdencia do Banco do Brasil	Canada
Alberta Investment Management Corporation (AIMCo)	Canada
Caisse de dépôt et placement du Québec (CDPQ)	Canada
Canada Pension Plan Investment Board (CPPIB)	Canada
Ontario Teachers' Pension Plan (OTPP)	Canada
OPSEU (Ontario Public Service Employees Union) Pension Trust (OP Trust)	Canada
PSP Investments	China
China Investment Corporation (CIC)	Finland
Ilmarinen Mutual Pension Insurance Company	France
CNP Assurances	France
PREDICA Assurances de Personnes	Germany
Allianz	Netherlands
PGGM	Netherlands
Stichting Pensioenfonds ABP	New Zealand
New Zealand Superannuation Fund (NZSF)	Singapore
GIC	Singapore
Temasek Holdings	South Korea
Korean Teachers Credit Union (KTCU)	South Korea
Samsung Fire and Marine Insurance	Spain
Mutua Madrileña	UK
BT Pension Scheme (BTPS)	UK
Kier Group Pension Scheme	UK
London & Regional Properties	UK
Universities Superannuation Scheme (USS)	USA
Dallas Police and Fire Pension System	USA
Maine Public Employees Retirement System (MainePERS)	USA
Metropolitan Life Insurance Company (METLIFE)	USA
Teachers Insurance and Annuity Association (TIAA)	USA

Crowdfunding

Crowdfunding is the practice of funding a project or venture by raising many small sums from a large number of people, typically via the Internet. Crowdfunding is a form of crowdsourcing and of alternative finance. In 2015, it was estimated that more than USD 34 billion was raised this way worldwide.

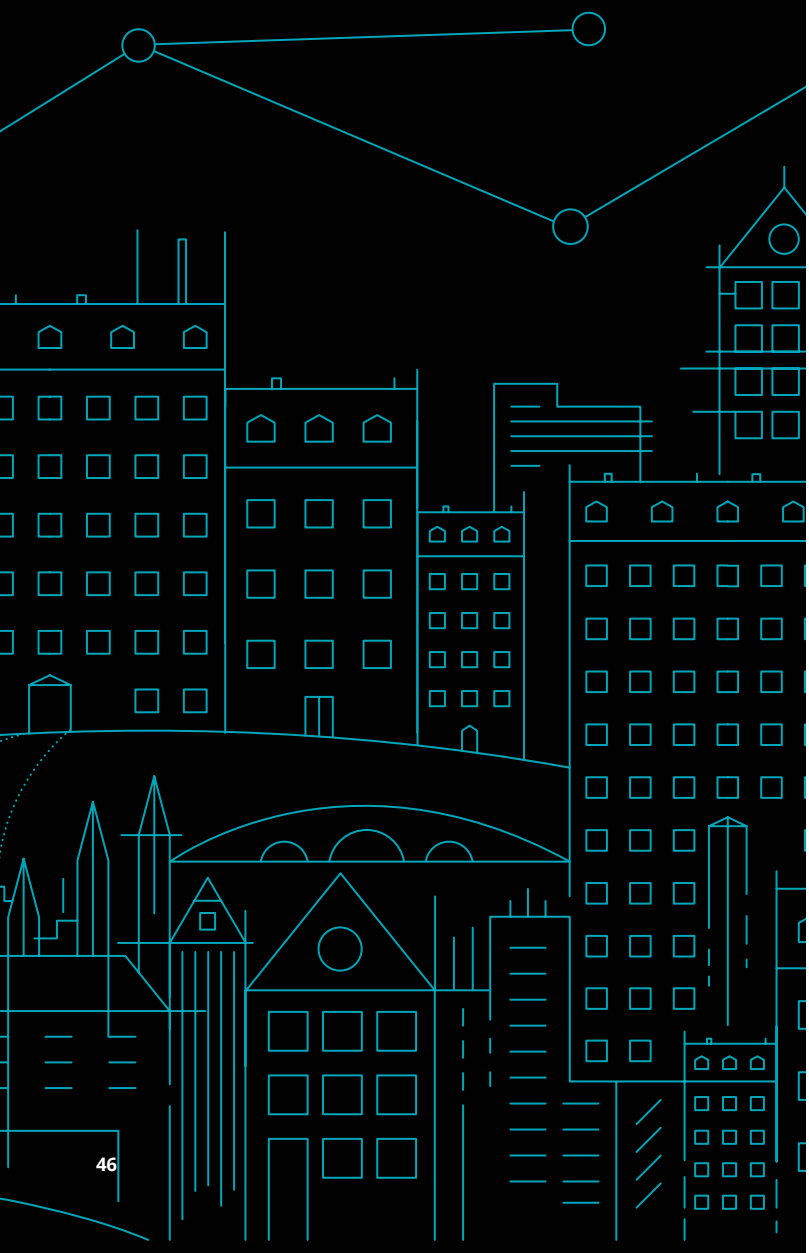
This crowdfunding model is generally based on three types of actors:

1) The project initiator who proposes the idea and/or project to be funded,
2) individuals or groups who support the idea, and
3) A moderating organization (the "platform") that brings the parties together to launch the idea.

Crowdfunding has been used to fund a wide range of for-profit and not-for-profit ventures, such as artistic and creative projects, medical expenses, travel, and community-oriented social entrepreneurship projects. It has also been used in combination with public funds for smaller community infrastructure projects.

Determine relevant procurement

Procurement structures

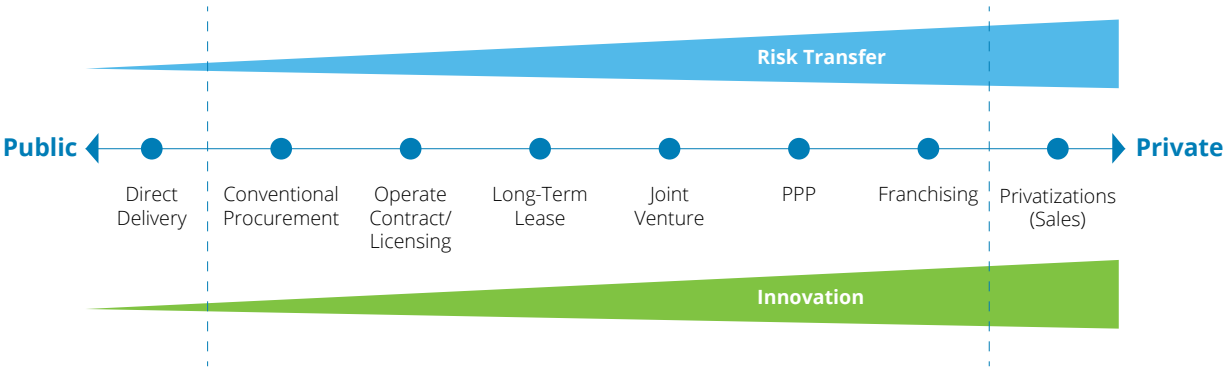


Over the past 20 years, public infrastructure has been developed mainly through traditional procurements (construct–only, design and construct, design/build/maintain), or through PFIs and PPPs. But these methods have limitations, particularly with regard to finite government budgets. While the easy option is to conduct a project without involving the private sector, this choice will hamper the delivery of much-needed infrastructure. A more appropriate strategy is to look beyond the usual choices—traditional government delivery or PPPs—and choose the most appropriate delivery structure for each project.

So far, this report has looked at innovative ways to secure funding and financing. In the following pages, we will look at the range of possible procurement/delivery models.

Which delivery model a government chooses depends on the level of private and public sector involvement the participants want or need. The more deeply the private sector is involved, the more risk the project can transfer to that sector, and the more innovation the partners can achieve. The private sector plays an increasingly important role these days in public infrastructure projects around the world. To promote innovation and create the greatest possible value, partners in these projects should stay open-minded about how private entities might participate.

Figure 1. Procurement methods Procurement methods



Long-term leases

Case study – Port of Melbourne to be privatized, 2016
In [year], an Australian consortium that includes Chinese investors won a 50-year lease on the Port of Melbourne. The Lonsdale Consortium purchased the lease for AUD 9.7 billion (USD 7.3 billion, EUR 6.5 billion). Lonsdale includes the Queensland Investment Corporation (QIC), the investment group Global Infrastructure Partners (GIP), and the Canadian pension fund OMERS. News reports indicated that GIP had entered the deal partly on behalf of China's sovereign wealth fund, CIC Capital.

The state of Victoria, which made the sale, planned to use about AUD 970 million of the proceeds on projects involving regional and rural infrastructure. Some of the money will fund the removal of 50 railway-level crossings.[5]

Case study – Mexico City's Avenida Chapultepec project, 2015
Mexico City's Avenida Chapultepec project has given a 40-year concession to a private trust to develop and operate the Chapultepec Cultural Corridor. The private investor will provide the necessary resources to build and maintain the project and will receive income from the services offered in the Corridor. Mexico City's government will also receive a small percentage of the yearly income. Avenida Chapultepec, in the heart of Mexico City, will evolve to become a three-level linear park, incorporating public and private transportation and pedestrian and retail areas.

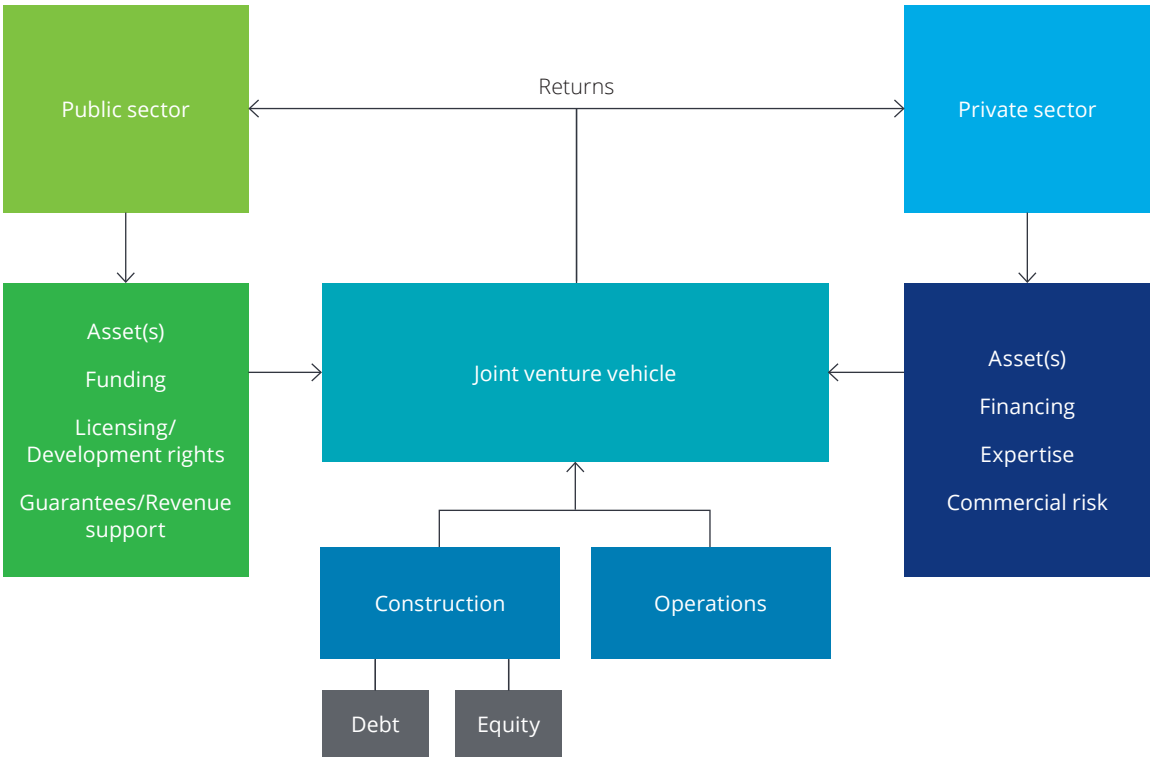
Joint ventures

A joint venture is a PSP model in which the public sector exploits latent value in its asset base to finance projects that involve land or property. This structure can work for several of the value capture mechanisms discussed earlier, including joint ventures, asset swaps, and elements of asset recycling. The objective of any joint venture is to harness the best resources, talent, and input from the public and private sectors. In most public-private joint ventures, the private sector partner manages most of the project on a commercial basis.

Typically, a joint venture is set up as a corporate vehicle, with the public and private partners as co-owners. The partners must agree on several critical elements:

Objective	What the parties are trying to achieve.
Ownership	Who owns the shareholdings.
Profit sharing	How profits and losses will be shared.
Risk transfer/phase	Who is responsible for which financial risks, and at what levels.
Initial investment	How the initial investment is made. In some cases, the public partner invests its assets, or else the equity it contributes consists of a license to use or develop one of its assets.
Financing	Who is responsible for obtaining financing. This generally falls to the private sector. There should be no recourse to the public sector where possible.
Downside	What happens if things go wrong. Can the public partner retrieve its investment or asset?

Figure 2. Potential joint venture structure



Possible forms that joint ventures might take

Land swap

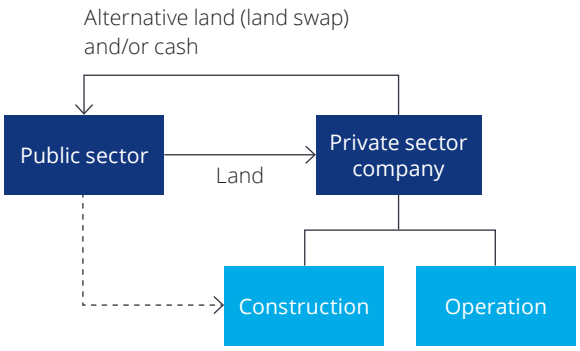
When a government owns or controls land that a corporation wants to develop (and the government is willing to exchange this land for value), one major decision it needs to make is what to require in exchange. The answer may determine which procurement process the government uses. In a land swap, the government might not require any procurement at all, if the private partner is offering land that has strategic value to the government and isn't available from any other source (e.g., adjoining land). If the parties are not using a land swap, the government might offer the land to the private sector partner on a basis with specific development requirements, using a procurement to select the partner. Either way, the government needs to calculate the underlying value of the land on a straight sale basis and also estimate the potential value to a corporation that develops the site.

Speed	Transaction can be completed relatively quickly particularly if simple source procurement is possible.
Efficiency	Can be quite efficient; however, proper evaluation is required to ensure value can be achieved.
Certainty	Straightforward transaction, so certainty is achievable.
Innovation	Limited; simply transferring asset and getting similar value in return.

Key steps in a land swap

- Understand value of land being swapped/sold.
- Determine whether the land that the private sector partner is offering provides any strategic value.
- Determine whether land that offers the strategic benefits the government seeks is available only from one private sector entity. If that is the case, the government might not have to conduct a procurement.
- Understand the financial benefits the government might gain by transferring the land to a private sector developer:
  - What are the risks involved in the development?
  - Why can't the government conduct the development itself?
  - What level of financing is required?
  - Are there limitations on what can be developed?
- Transfer the land with the provisions needed to protect public sector value.

Figure 2. Land swap structure Land swap structure



Development rights

A government might choose to give a company development rights if this would allow the private sector partner to generate significant returns. The key to success is for the public sector to set an appropriate value on these rights and determine what it requires in return. Timing is also important: ideally, the government partner will get its consideration transferred before the private sector receives its benefit. Because development rights typically involve real estate development, this structure is easiest to deliver during a vibrant real estate market.

Examples of projects that involve the transfer of development rights include:

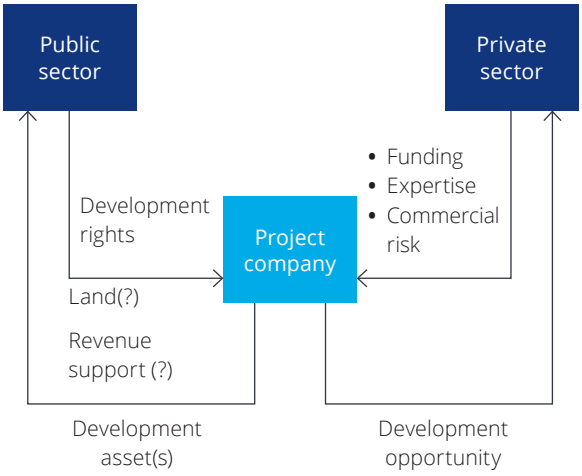
- **Dublin Social Housing Projects** – The Dublin City Council gave developers land on which to develop residential and commercial real estate. In return, the developers delivered 300 social housing units to the local authority before making any private sales.
- **Greystones Harbor** – In this project, in County Wicklow, Ireland, a company agreed to develop the harbor area (cost €60 million) and operate the marina there at its own expense for 30 years. In exchange, the company received development rights on land surrounding the new harbor. The harbor was developed and delivered to the local authority. Unfortunately, due to a subsequent drop in property values, the private sector partner lost a great deal of money, as the real estate development could not be financed in the middle of a market crash. But the development was eventually completed. Despite the impact on the private sector, due to structuring and contractual requirements, the public sector had its completed asset in time.
- **Salford City Council** – To kick-start a speculative office project on the Greengate Embankment, the Council guaranteed the developer 50 percent of the rental value in a 196,000-square-foot office building that forms the first phase of a 1-million-square-foot development.
- **Newcastle City Council, Stephenson Quarter** – The Newcastle City Council established a £50 million recyclable investment fund, using Public Works Loan Board (PWLB) financing, to deliver capital projects in Coventry. Eligible projects are those that will contribute to the business rate base, will align with the Council's investment priorities, are likely to be deliverable, and will create or protect a significant number of jobs.
- **Leeds City Council, Connex 45** – Leeds City Council awarded Wilton Developments a £670,000 grant from its Building Foundations for Growth Fund to deliver two speculative industrial units, one of them 30,000 square feet and the other 50,000 square feet. The Council guaranteed that if the units were not leased within two years, it would lease them itself, in exchange for a low rent. FedEx has since taken a 10-year lease on the larger unit.

Key steps in a development rights agreement

- Identify development rights that are relevant and in demand.
- Carefully assess the business model to determine how much value is available for sharing.
- Determine public sector requirements.
- Ideally, ensure that public sector objectives will be delivered first.
- Start procurement.

Speed	Can be completed, but time-consuming to design requirements and run a procurement.
Efficiency	As long as the agreement is structured properly and fairly, final delivery can be efficient.
Certainty	Key is to make public sector requirements the primary objectives.
Innovation	Can bring greater innovation to delivery. However, it is vital to define delivery requirements.

Figure 3. [Title in sentence-style case here]



Co-development joint venture

Co-development is when the government agrees to share some or all of the commercial risk on a development project in exchange for a share of the overall returns. How much risk the government shares, and what proportion of the returns it receives, usually depends on how much cash or assets the government contributes to the project at the start. While this structure exposes thse public sector to more risk than other models, it may be a better option if the value offered by the private sector for the public asset is not considered appropriate. It may also be a good choice if the project is likely to produce significant returns and the potential risk is manageable, so that the government can share in the returns.

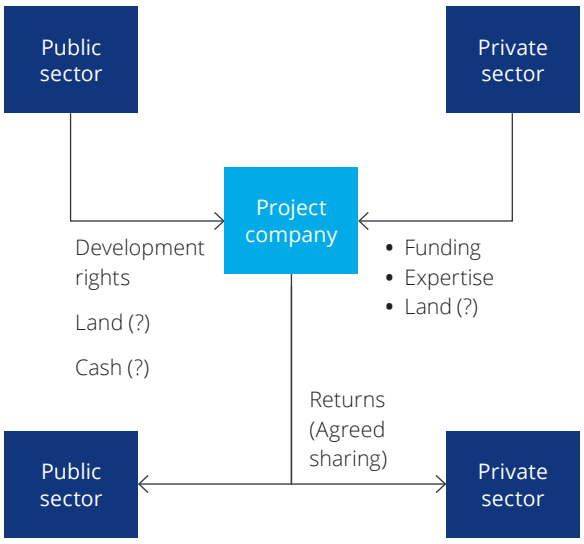
Before entering into this type of agreement, the public sector partner needs to fully understand the commercial model, the potential risks, and the reputational risks of being associated with the project. The government partner should also monitor the project on an ongoing basis.

Speed	Often depends on the procurement structure required, the level of interest in the private sector (is this the deal they really want?), and the simplicity of the commercial arrangements.
Efficiency	Can be an efficient structure, as the joint arrangement means public sector can monitor progress from within the structure.
Certainty	Reduced, as return is based on eventual outcome rather than a particular delivery.
Innovation	Can be innovative. Depends on details of the joint venture.

Examples include:

- **Leeds City Council, City Arena** – Leeds City Council developed a new £80 million concert and events arena, now run by operator SMG Europe, using capital investment and enhanced revenue streams created by the arena. The Council has also used put options to kickstart speculative development.
- **Bradford, Provident Financial, Southgate Centre** – The Bradford Council provided £6 million of mezzanine financing to McAleer and Rushe to retain Provident Financial's head office, with 700 employees, in a 120,000-square-foot, grade-A building. The project also included the development of a 200-room hotel.
- **Oldham Council, Old Town Hall** – This project converted Oldham's Old Town Hall, a derelict Grade II listed building, into a 1,000-seat, 8-screen cinema. The building also includes other family leisure facilities, including four restaurants. There is a £16 million public/private funding package considered, which is believed to comprise a mix of prudential borrowing and underwriting by the Council.
- **Derby City Council, Sadler Gate** – First speculative office development in Derby city center for 25 years. The 32,000-square-foot office received approximately £3 million from the Council.

Figure 4. Co-development JV structure



Asset recycling

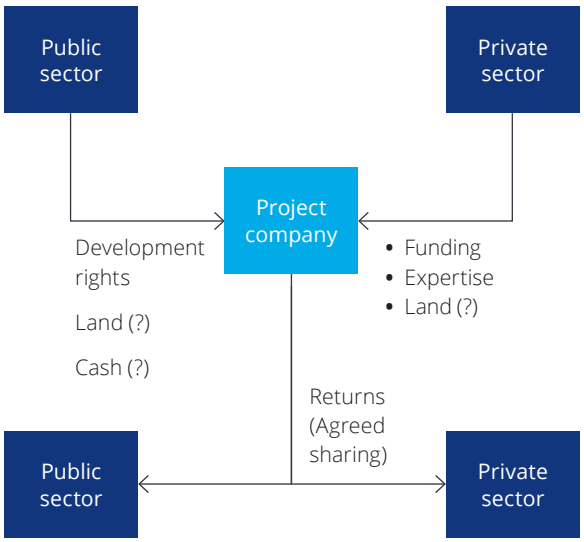
In asset recycling, the government sells an asset it doesn't need to a private sector entity, or the two parties enter into a long-term lease. The payment received is set aside and placed into a fund that the government uses to invest in new infrastructure projects. This structure has been used successfully in Australia and Canada to fund new projects when traditional government funding was not available. The allocation of the proceeds for infrastructure helps to overcome political resistance to selling public assets. The sale of the asset is not necessarily permanent, as structures and long-term leases for up-front payments could be used to get up-front payments (lower than in a sale) without losing ultimate ownership of the asset.

Speed	Full procurement will be required to sell assets and also to establish funds.
Efficiency	Can be reasonably straightforward, particularly if the asset is in demand.
Certainty	Allows future certainty for delivery of projects with cash available; less certainty on sale of asset (or value achieved) until sale completed.
Innovation	Strong potential.

Examples include:

- **Coventry City Council, Coventry Investment Fund** – The Council established a £50 million recyclable investment fund, using Public Works Loan Board financing, to deliver capital projects in Coventry. Eligible projects are those that will contribute to the business rate base, will align with the Council's investment priorities, are likely to be deliverable, and will create or protect a significant number of jobs. The Council made a provision of grant under the block exemptions in exceptional circumstances but wished to maintain the integrity of the fund's value.

Figure 5. Asset recycling – potential structure



Public-private partnerships (PPPs)

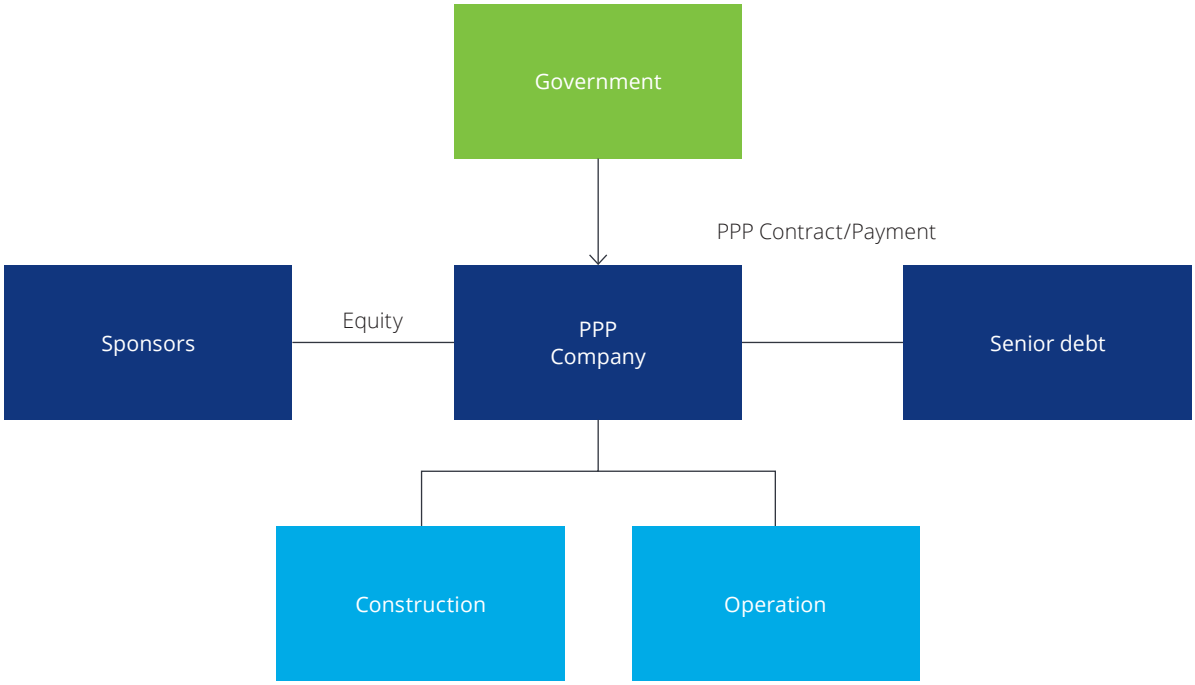
Under the public-private partnership (PPP) and private finance initiative (PFI) models, the government pays a private sector firm (the PPP Company) to provide a service. The terms are very detailed and the operation of the contract is generally less collaborative than in the joint venture arrangement.

Governments are increasingly turning to PPPs to attract private investment and corporate expertise. PPPs aim to increase the efficiency of infrastructure projects by creating a long-term relationship between the public sector and private business.

Critical differences between a joint venture and the PPP model are:

- The public sector influences the PPP Company via a project agreement, rather than through involvement in a joint venture company.
- The contract period for a PPP tends to be longer than for a joint venture, as it typically involves asset development followed by operation for 20–25 years.

Figure 6. [Title in sentence-style casing here]



A PPP arrangement differs from a conventional public procurement in several respects:

- A long-term PPP contract is based on the procurement of services, not of assets.
- It involves the transfer of certain project risks to the private sector, notably in the areas of design, build, operations, and finance.
- It tends to specify project outputs rather than project inputs, focusing on the whole life cycle of the project.
- It uses private financing (often project finance) to underpin the risks transferred to the private sector.
- Payments to the private sector reflect the services delivered. The company may be paid by users (e.g., in a toll highway), by the authority (e.g., availability payments or shadow tolls), or by a combination of both (e.g., low user charges combined with public subsidies for operations).

Many countries initially developed PPPs in the transport sector. Once they verified the benefits of these arrangements and became adept at using this model, governments started to extend the use of PPPs to other sectors, such as education, health, energy, water, and waste treatment.

Some countries, such as Canada, are accelerating their use of PPPs. Others, such as the United States and China, are using the model more conservatively. The use of PPPs raises a number of complex issues and choices, the solutions to which are often specific to the project or country involved. But a number of fundamental issues come up time and again across a wide spectrum of PPPs. These include flexibility to change over time to meet government requirements, making long-term funding available to meet contractual payments, and the fact that high gearing and low profit margins pose a risk of default by contractors. Legal impediments and uncertainties regarding PPPs affect both the public and private sectors.

As detailed in the table below, PPPs can have a variety of structures depending on the services required of the private sector.

Design build	DB	Private sector takes responsibility for the design and construction of the project and hands the project back to the private sector at the end of construction. This is normally used for simpler standardized buildings and brings efficiencies of having the design and construction linked. In some instances, the contract can be extended to include long-term maintenance, which encourages the design and construction to consider the long-term operation and maintenance of the asset and (hopefully) deliver better Value for Money (VfM).
Design build and finance	DBF	A form of PPP that involves using private finance to procure an asset, but does not give the private sector an interest in the operation of the associated assets. This brings the benefits of the DB model coupled with deferred payments for the asset.
Design build finance and operate	DBFO	This is a contract between the public and private sectors to provide a specific service coupled with the delivery of an asset. The private sector will design, build, finance, and operate the asset in the long term, with payment based on the provision of the underlying service, including availability of the asset. At the end of the term, the asset reverts to the public sector based on an agreed standard of asset quality/maintenance at the time.
Design build and operate	DBO	Government involves the private sector to benefit from its experience and expertise but does not seek private sector finance, deeming it unnecessary or too costly due to scale of the project or the associated risk.
Integrator model		Sometimes a government needs to complete multiple projects of a similar type but wants to avoid the delays and inefficiencies that would arise if it procured a contractor/PPP contract for each asset. The government may instead conduct one procurement to appoint a single private entity to manage all of these projects. This integrator delivers VfM by procuring the individual projects on an agreed basis.

Case study – Welspun Enterprises and National Highways Authority of India, March 2016
In 2016, the National Highways Authority of India (NHAI) signed an agreement with Welspun Enterprises to develop the first phase of the Delhi-Meerut Expressway, a project designed to reduce congestion in the city of Delhi. Under this concession agreement, Welspun Delhi Meerut Expressway Private Ltd (WDMEPL) will develop this first phase of the expressway at a cost of INR 841.50 crore and then operate it for 15 years. During construction, NHAI will fund 40 percent of the bid project cost, while WDMEPL will arrange the other 60 percent. During the operation period, NHAI will pay the concessionaire this 60 percent in semi-annuity, along with interest thereon. NHAI will also pay the concessionaire an annualized operations and maintenance cost of INR 3.95 crore for the maintenance of the road during this period.

Case study – The GO Transit Maintenance Facility PPP, Ontario, 2015
GO Transit, the public transportation agency in southern Ontario, developed the new East Rail maintenance facility in 2015 to accommodate light and heavy train maintenance work, including daily maintenance for up to 22 passenger trains. The facility also provides additional train storage to support GO Transit's service expansions, particularly two-way and all-day train service. Initial plans called for the Ontario government to fund up to 75 percent of the project and select a partner from the private sector to finance the remaining 25 percent.

Case study – Regina Wastewater Treatment Plant and P3 Canada Fund
In [year], the city of Regina, Saskatchewan, signed a design-build-finance-operate-maintain (DBFOM) project agreement for the Regina Wastewater Treatment Plant Upgrade Project. Regina undertook this project to meet new wastewater effluent quality standards set by the Saskatchewan Ministry of Environment, with a deadline set for the end of 2016. The city chose EPCOR Saskatchewan Water Partners as its private partner.

EPCOR planned to finance the CAD 181 million in construction costs from its balance sheet. The P3 Canada Fund supported the project with a grant worth approximately CAD 48 million. The city expected this procurement model, including the grant from P3 Canada, to save it CAD 138.1 million, making the project 29.3 percent less costly than it would have been if the city had used the DBB model.

Case study – New Zealand PPP, 2010
In early 2010, the New Zealand government announced that it would commission a new 960-bed prison in Wiri, South Auckland, to be designed, built, and operated through a public-private partnership. The project would help to address the need for more prison beds in New Zealand and to replace old, run-down facilities.[6]

The NZD 693 million, 25-year project would employ a design, build, finance, operate, and maintain (DBFOM) model. Government officials said they were open to greater private sector involvement in projects such as this one, since they cost less than publicly led projects and can deliver better services and value for taxpayers.

Social outcomes such as ensuring sentence compliance and reduced recidivism, and linking these outcomes to an incentive payment mechanism, were a key to this PPP.

This contract is particularly innovative because it includes financial penalties for the SecureFuture Wiri consortium (owner) if its prisoner rehabilitation programs fail to reduce recidivism by more than 10 percent compared to publicly run prisons.

Franchising

Privatization

Public agencies already use privatization, broadly defined, as a procurement and service delivery method. It includes contracting, grants, vouchers, volunteerism, public-private partnerships, franchise, service shedding, deregulation, and asset sales, among other options. But under a strict definition of privatization, the full provision and ownership of the associated assets sit with the private sector.

If implemented successfully, privatization offers many public benefits, including efficiency, innovation, and high-quality services. It can help governments save money and streamline their operations. This is why many governments have passed laws to provide incentives for private investment, including foreign private investment. When using this model, however, it is important to implement appropriate regulation, especially when privatization gives a monopoly to a service provider.

What this means for Europe

Scale of market

€3T

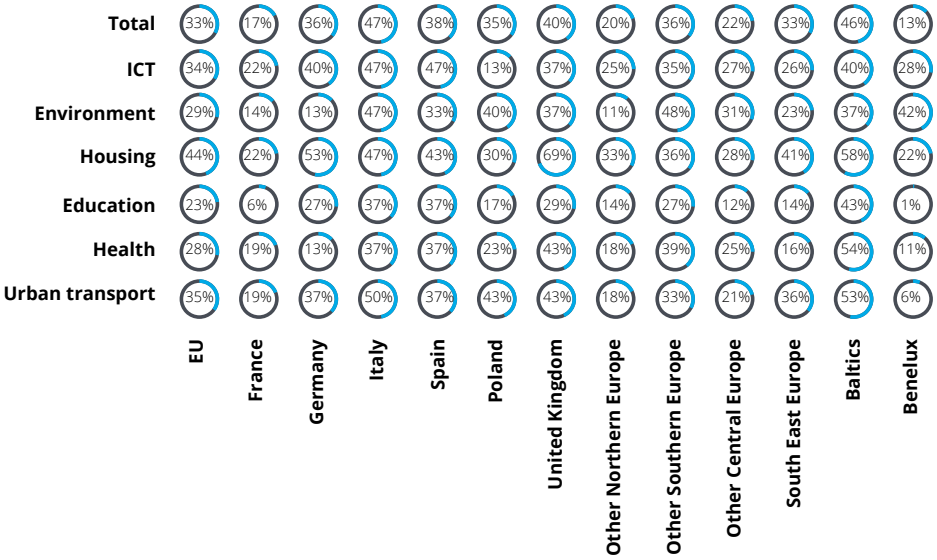
The amount of investment needed in European infrastructure by 2020, according to the European Commission

€6B

The annual spend needed to keep Europe competitive, according to European Investment Bank

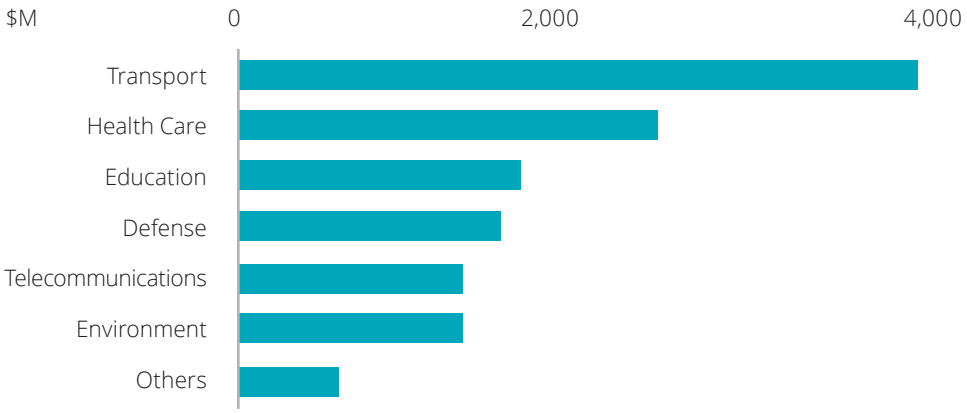
Base: All municipalities.

Figure 7. Perceived investment gap by country/region



Structure trends

Figure 8. Sector breakdown by value of PPP transactions in 2016



Financing trends

- Public investments in infrastructure by EU member states have seen massive cuts over recent years; down roughly 11 percent since 2010.
- On the other hand, Europe's capital markets are currently experiencing historically high levels of liquidity as a result of the ECB's expansive monetary policy. This market environment makes it increasingly difficult for investors—especially commercial banks and institutional investors such as insurance companies and pension funds—to find suitable avenues for investment with attractive rates of return as an alternative to the extremely low interest rates offered by government bonds.
- The United Kingdom, France, and Germany dominate private infrastructure investment in Europe.

Market issues identified

- Risk structure and expected yields are not aligned.
- Regulation in the EU is too complex, unpredictable, and fragmented across countries.
- Supervisory requirements for banks and insurance companies pose certain obstacles.
- Governance mechanisms fail to meet investors' requirements.
- Standardized projects are few and far between.

What this means for the Middle East

Scale of market

Key growth markets in 2017

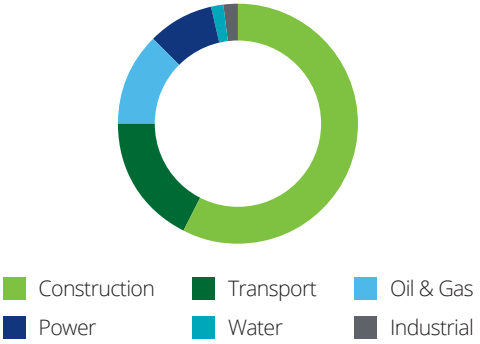
Qatar: A robust growth in Qatar's construction market is anticipated over the forecast period up to 2025, as the country prepares to host the FIFA 2022 World Cup and works to diversify its economy away from the hydrocarbons sector. The most significant industry expansion will likely come between 2017 and 2022, at an annual average of 12 percent in real terms. After this, growth may slow as big-ticket projects related to the major sporting event conclude.

United Arab Emirates: The Emirates construction industry will likely record robust growth throughout the forecast period for two reasons: 1) Investment may flow into readying Dubai for Expo 2020, and 2) the Emirates will likely prioritize infrastructure development in an attempt to reduce their economy's reliance on oil revenues in the depressed commodities environment.

Oman: Growth in Oman's construction sector will likely accelerate in 2017 and beyond on the back of continued deficit spending and a favorable regulatory environment. Growth patterns in the coming years will reflect the government's commitment to diversifying the country's economic base, with nonresidential building driving growth in 2017 and transport emerging as a growth engine over the longer term.

Kingdom of Saudi Arabia: – [TBC]

Figure 9. Structure trends



- The regional projects pipeline appears solid, with over $2 trillion worth of projects currently in the planning stage, indicating there is still a need and demand.
- Construction is the largest sector, with more than $1 trillion worth of projects in the pipeline.

Financing trends

- Throughout the GCC, sovereign wealth funds have often been a principal revenue source for funding social infrastructure programs.
- Export credit agencies (ECAs) are another form of financing that GCC governments are turning to, on account of low oil prices. Previously, the Al Sufouh Tram in Dubai received loan guarantees from ECAs in France and Belgium to support construction contracts won by their domestic companies. Also, Kuwait National Petroleum Company reportedly has selected ten international banks to provide an ECA-backed loan of more than $5 billion.
- PPP is the prime alternative project delivery tool for GCC governments to consider in the current climate. Dubai and Kuwait introduced new PPP laws in 2015. Qatar and Oman are also currently putting frameworks in place for PPP and private investment, and this issue is under active consideration in Saudi Arabia.

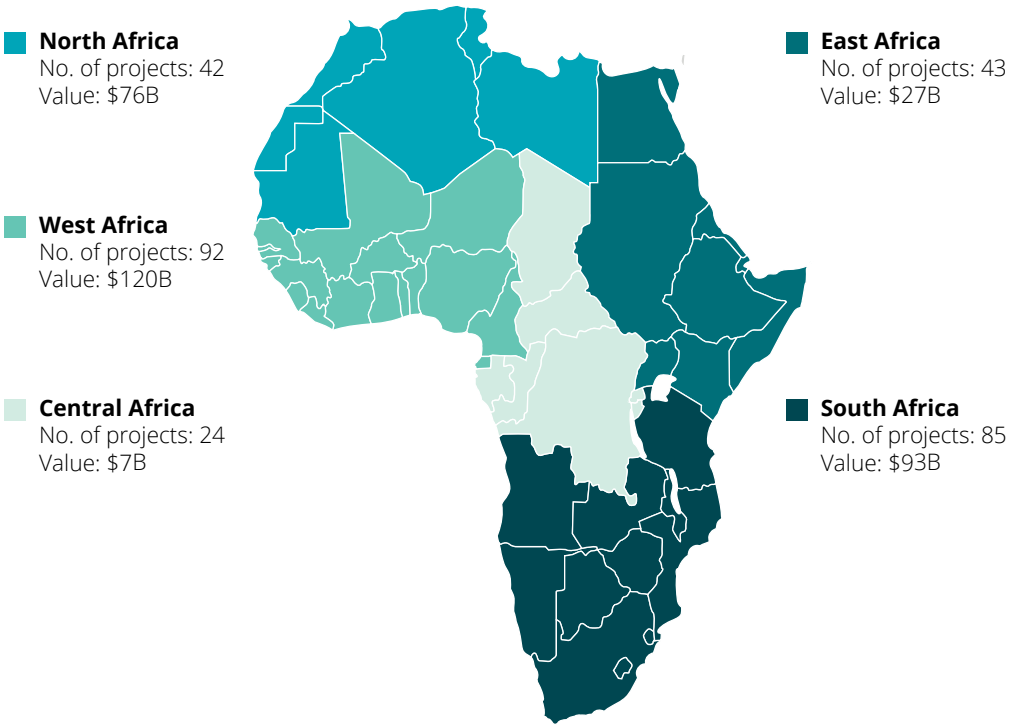
Market issues identified

- Fiscal and structural weaknesses remain key challenges in many MENA countries.
- Long-standing problems such as power shortages, youth unemployment, and a lack of access to finance have conspired to hold back economic growth in this region of $350 million.
- Falling oil prices have significantly affected the GCC's infrastructure projects. The slump has required the GCC governments to completely reassess their public spending strategies, as they are forced to plug revenue gaps in their extensive nation-building programs in segments of the economy not directly influenced by oil, such as tourism, travel, and infrastructure.

What this means for Africa

Scale of market

Figure 10. Committed investment



Structure trends

Projects by sector	Number of projects	Value of projects ($B)
Energy & Power	60	59.7
Transport	96	62.8
Real Estate	64	53.0
Water	11	4.3
Mining	8	26.4
Oil & Gas	13	84.6
Shipping & Ports	24	31.4
Others (Social projects)	10	1.6

Financing trends

- Foreign aid continues to play an important role in funding infrastructure. Multilateral development banks are important financing sources for infrastructure in sub-Saharan Africa, especially in the lower-income countries.

Market issues identified

- Corruption, lack of transparency, and deal-blocking entrenched interests still afflict Africa.
- African countries have limited public sector capabilities, insufficient political will, policy uncertainty, and weak regulatory environments.
- They also suffer a shortage of available people with necessary technical skills.
- Financing complexities are attributable to narrow financial markets, higher actual and provisional risks, longer project durations, significant cost overruns, and currency mismatches.
- Some experts say that project approvals can take twice as long in Africa as in other regions.
- In Africa, private investors often must act as project developers, adding 10–15 percent to the project costs and lengthening the project life cycle.
- Pension funds and insurance resources—huge pools of capital for infrastructure investment in other regions—are rarely used outside South Africa.

What this means for Asia Pacific

Scale of market

Estimated infrastructure needs by region, 2016–2030			
Projects by region	Projected annual GDP growth (%)	Investment need ($B)	Annual average ($B)
Central Asia	3.1	492	33
East Asia	5.1	13,781	919
South Asia	6.5	5,477	365
Southeast Asia	5.1	2,759	184
The Pacific	3.1	42	2.8
Asia and the Pacific	5.3	22,551	1,503

Structure trends

Estimated infrastructure needs by sector, 2016–2030			
Projects by sector	Investment need ($B)	Annual average ($B)	Share of total (%)
Power	11,689	779	51.8
Transport	7,796	520	34.6
Telecom	2,279	152	10.1
Water & Sanitation	787	52	3.5
Total	22,551	1,503	100.0

Financing trends

Infrastructure finance

- Tax and non-tax revenue
- Public bond financing
- Loans//grants from DFIs and official development assistance
- Debt
- Commercial banks
- Corporate bonds
- Public and private equity

- The public sector currently dominates infrastructure financing. Its share ranges from 90 percent in East Asia to 60 percent in South Asia.
- Innovative financing methods are being considered for financing infrastructure development, such as land value capture or capital recycling and user charges for cost recovery.
- Private sector investments are high in the power and telecommunications sectors. PPPs are an important modality for attracting private investment in infrastructure.

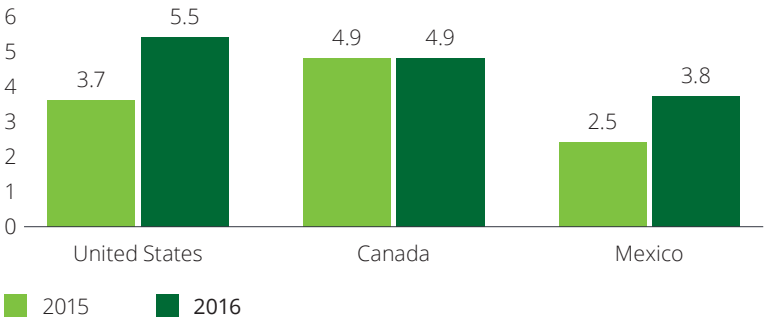
Market issues identified

- Weak legal and regulatory framework in certain Asian countries blocks private sector capital.
- Poorly structured or prepared projects; grantors do not perform a feasibility study for the PPP projects.
- Emerging markets often lack advisory capability (legal, technical, and financial); a robust construction market that can address the many risks inherent in large-scale infrastructure; a banking and capital market that can sustain and fund all the required infrastructure needs of a country; and the operator is required to deliver efficient operations and asset management.
- Projects face land acquisition problems.

What this means for North America

Scale of market

Figure 11. Infrastructure project value by country ($ trillion)



Structure trends

Projects by sector	Investment need ($B)
Highways and Bridges	38.4
Urban Mass Transit	79.5
Railways	145.3
Airports	32.0
Ports and Logistics	91.4
Electricity Generation and Transmission	58.0
Energy (Oil and Gas)	49.0
Water and Wastewater	39.0

Financing trends

- Infrastructure in the United States is funded by a combination of tax revenue and user fees. The great majority of publicly owned infrastructure assets are currently financed in one of two ways:

1) Federal grants and loans, state and local expenditures, and municipal bonds. Ultimately, these projects are funded by tax revenues.
2) Revenue bonds backed by user fees, such as tolls, fees, and charges, generated by enterprise systems such as toll roads, water and sewer systems, airports, and public power utilities.

- State and local governments in the United States have used municipal bonds to finance infrastructure for nearly two centuries. Since enactment of the first modern federal income tax in 1913, interest on municipal bonds has been exempt from that tax. The interest income is also exempt from state and local income taxes in the jurisdiction where issued.
- PPP interest is building in the United States. This includes products such as general obligation bonds; private activity bonds (PABs); certificates of participation; 63-20 financing for not-for-profit corporations; and credit-assistance programs.
- Pension funds and PPPs are largely used to finance projects in Canada.

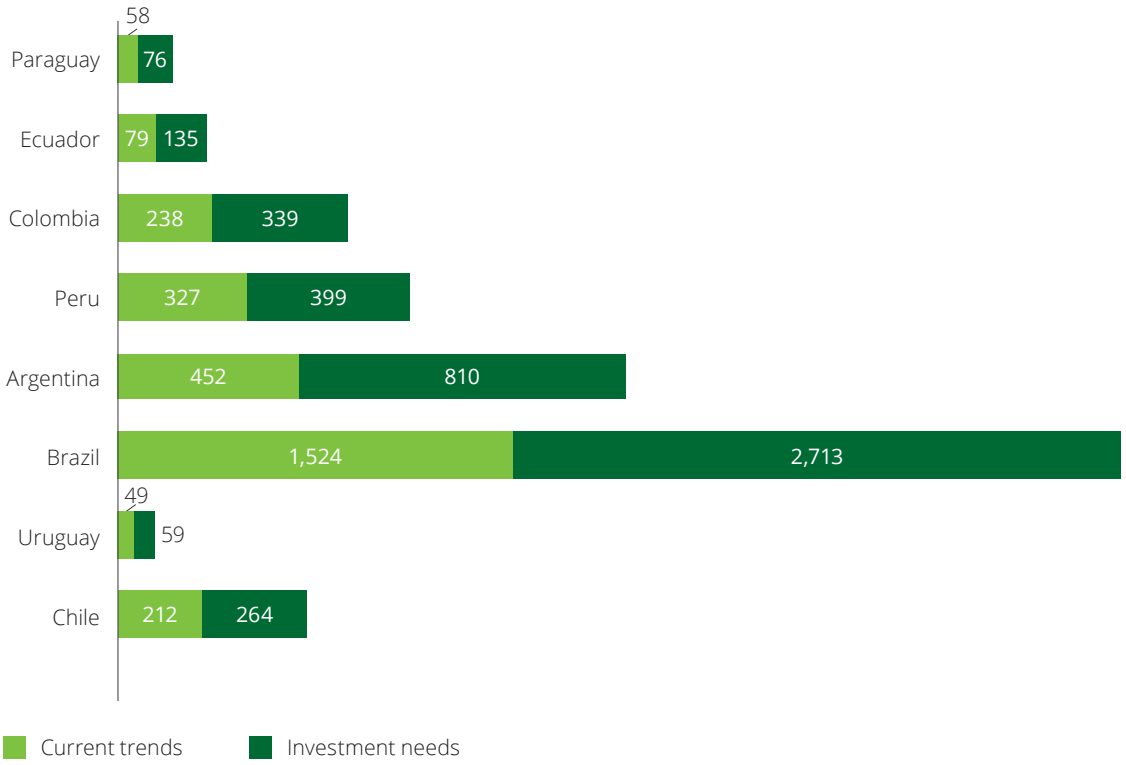
Market issues identified

- World Economic Forum ranks U.S. 10th internationally in quality of overall infrastructure.
- Across the country, municipalities are struggling to manage the repair of roads and bridges reaching the end of their life cycles.
- The overly complex, time-consuming, and uncertain environmental review process deters infrastructure investment, wastes resources, and delays important project benefits.

What this means for South America

Scale of market

Figure 12. Infrastructure project value by country ($ billion) Infra project value by country ($ bn)



Structure trends

- In South America, the biggest infrastructure needs are in roads, bridges, waterways, and ports to help lower the cost of exporting the region's abundant natural resources.
- There are also potentially lucrative investment opportunities in telecommunications, energy projects, and natural gas transport.

Market issues identified

- Latin America faces higher debt levels (as a percentage of GDP).
- Commercial banks in Latin America now must adhere to Basel III regulations, which would affect the lenders who back greenfield and construction-phase projects.
- High transaction costs, weak capacity, political and governance risks, and policy and regulatory barriers in most countries in the region make risk-adjusted investment returns too low to attract private investment.
- The pipeline contains too few well-prepared projects; appropriate financial instruments of sufficient liquidity (such as project bonds) are not available to attract local investors; inconsistencies in contracts, concessions, and bidding documents are common.

Financing trends

- Since 2005, the share of public investment focused on infrastructure has risen from 30 percent to 50 percent.
- Commercial banks and multilateral banks also have been major sources of funding for infrastructure.
- In addition, infrastructure projects have received financing from ECAs and pension funds.

What this means for smart cities

Scale of market

Figure 12. Smart cities, 2025

‡ Smart city projects that are being tried/implemented within a small scale for a specific industry/public entity.

Growth

- Projections show that the smart cities market is expected to grow by 20 percent annually, and from more than $300 billion in 2015 to more than $750 billion in 2020.
- The largest market currently is Europe, with a size of close to $130 billion. The Asia Pacific region is expected to grow at the highest rate, nearly 37 percent, increasing the size of the market from around $50 billion to $220 billion.
- The projected growth in the Asia Pacific region is fueled by factors such as the launch of many new projects in China, South Korea, Japan, Singapore, Thailand, India, and Australia in 2015. Many of these projects are part of large-scale development initiatives that involve significant capital spend.
- Even though Asia Pacific is currently seen as having the highest potential, the Middle East and Africa, as well as Latin America, also have high potential, with expected growth of 23 percent and 27 percent, respectively.

Financing trends

Financing sources	Funding sources
Commercial banks	Property taxes
Development banks	Business taxes
Municipal bonds	Municipal income taxes
Green bonds	Tolls & user charges
Tax increment financing	Pay-for-performance models
Leasing & vendor finance	Asset disposals
Credit guarantees	Federal grants

What this means for EU institutions/International donor funds

[TBC]

Deloitte services

The challenge of paying for smart cities

Business models for attracting private financing

City leaders can vastly increase the odds of success on large-scale smart cities projects by exploring the full range of options for funding and financing.

Attracting investors with a viable strategic plan

Smart cities are a new concept with new technologies. Attracting investors requires a comprehensive strategic plan that clearly communicates the opportunity, including a robust business model, a creative approach to funding and financing (new sources of revenue, new business models for recovery and value capture), and innovative financing structures for investors.

Matching projects to appropriate financing requires a full understanding of the project, potential cashflows, financing options, and available procurement methods.

Model for delivery of a successful project

Deloitte provides cities with an approach, comprehensive information about funding and procurement options, and insights from other smart cities projects. By helping city leaders capitalize on the strengths of a project and explore options, we help cities create business models that attract private financing.

Given ongoing investment demands and funding pressures in government, the private sector will inevitably play a role in public infrastructure in the coming years. Deloitte can assist cities with public-private collaboration on financing and bring stakeholders together for successful large-scale smart cities projects.

Deloitte's account teams should be able to start productive conversations with public and private sector clients operating in the public sector space and pursue new opportunities. When planning to align to service and offerings, please use the below guide to inform the strongest approach in your market:

Relevant industries/sectors

Government & Public Services
- Civil Government
- Transport
- Defense, Security & Justice
- International Donor Organizations

Financial Services
- Private Equity/Infrastructure funds
- Real Estate

Energy & Resources

Technology, Media & Telecommunications

Financial Advisory

Corporate Finance Advisory
Lead Advisory – Sell Side (advising public sector as a seller/raising capital and 'selling' a contract for services) in cluding privatization and asset recycling

Corporate Finance Advisory
Lead Advisory – Buy Side (advising private sector seeking to acquire (buy) assets/contracts from the public sector.

Debt & Capital Advisory
Capital raising (debt or equity) by public or private sector for projects from variety of sources

Treasury Services
Advice around treasury aspects (derivatives, cashflow management, FX management) of financing arrangements

Financial Modelling
Complex modelling services required for every project/ asset considering the long term life of the asset and the associated cashflows including financing

Economic Consulting
Review of the economic impact of particular project(s) on the overall economy

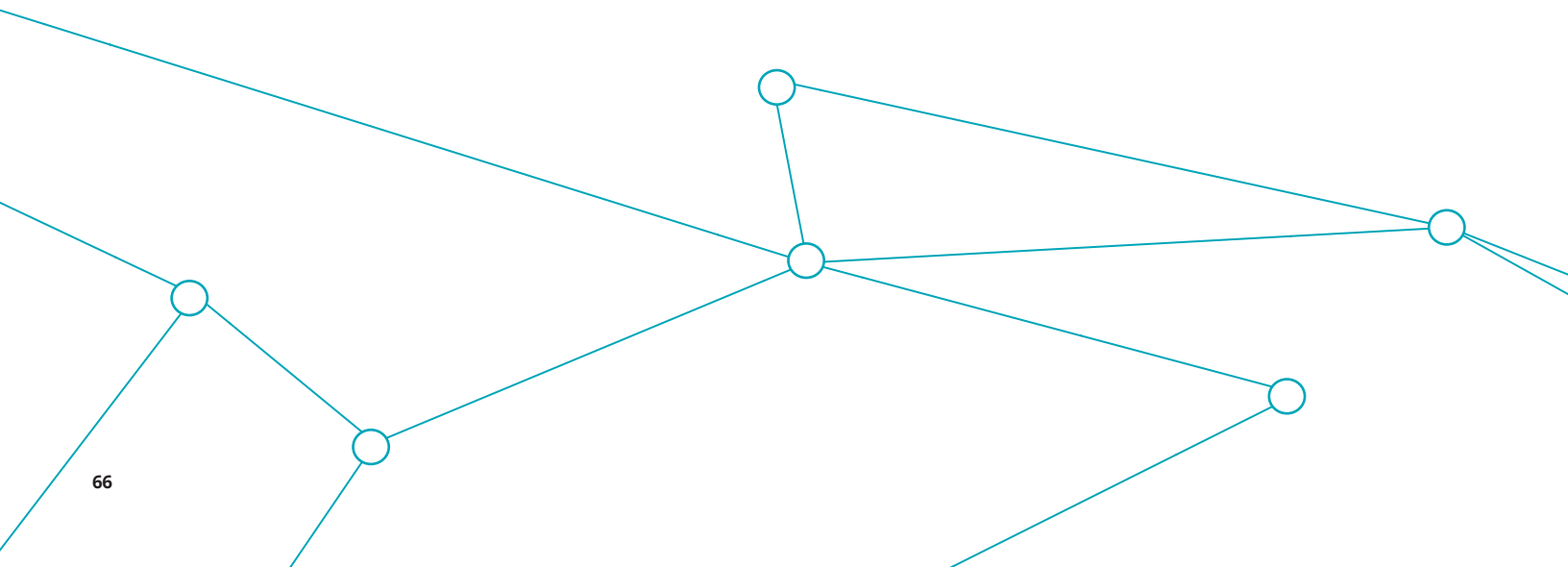
Government & Infrastructure
Public sector advisory assisting in development of business case, procurement options and preparing interim assessments of transaction value for money. Advising on procurement processes.

Infrastructure M&A
Advising private investors on transactions regarding privatization opportunities and acquisition of assets being transacted under asset recycling plans by public sector

Capital Projects
Assistance to public and private sector during construction and operation phase to consider cost and delivery certainty

Consulting

S&O
Determine the optimum operating model for service/project. Consider revised operating model of public sector post 'outsourcing' with private sector participation



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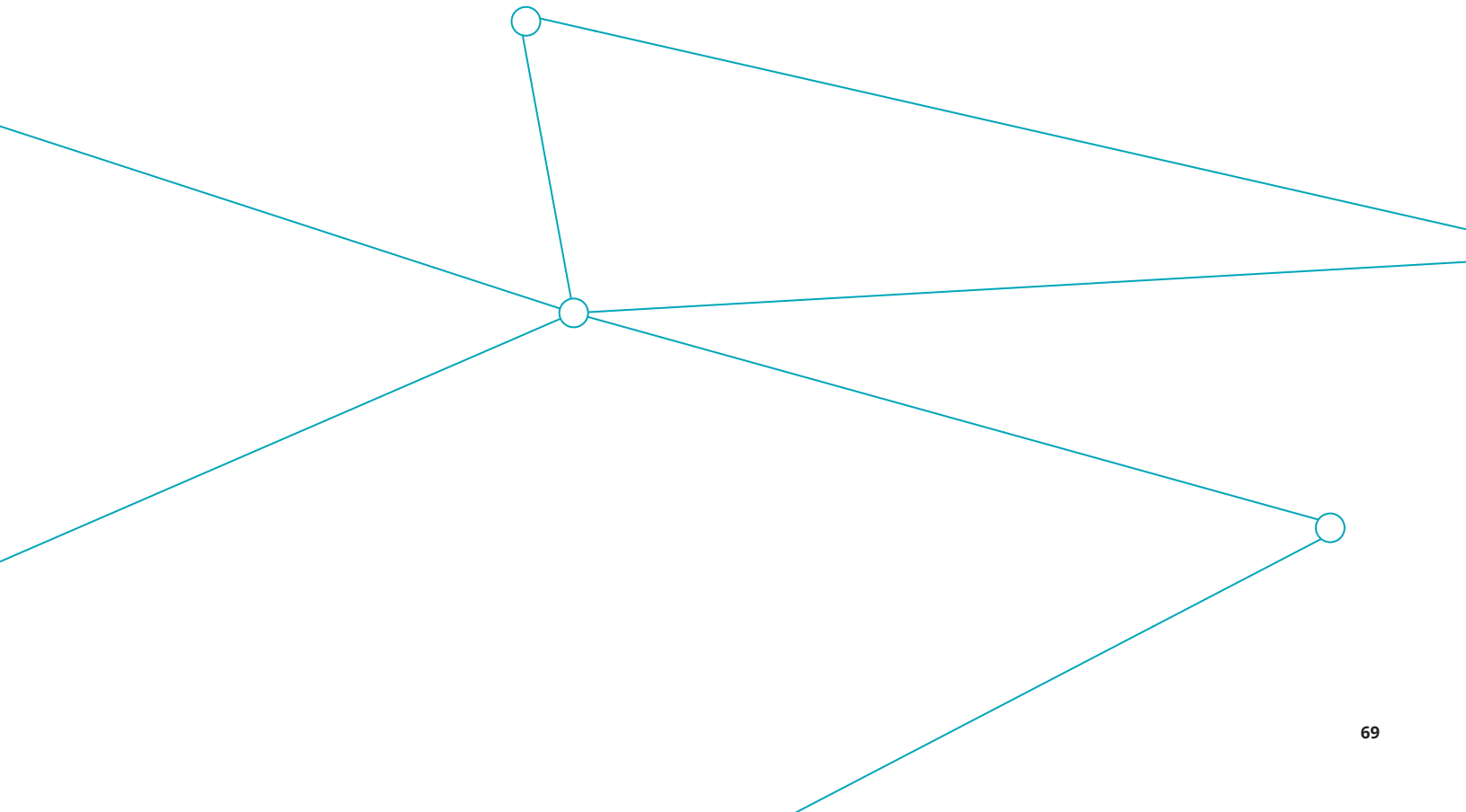

References

Ambrose. "Senegal issuing second sovereign Sukuk." *Sukuk.com*, June 29, 2016. https://www.sukuk.com/article/senegal-issuing-second-sovereign-sukuk-4930/.

American Public Transportation Association. *Value capture for public transportation projects: Examples*. August 2015. https://www.apta.com/resources/reportsandpublications/Documents/APTA-Value-Capture-2015.pdf.

Anderson, Michael. "Seattle adopts commercial linkage fee to fund affordable homes." Center for Community Change, Winter 2016. https://housingtrustfundproject.org/seattle-adopts-commercial-linkage-fee-to-fund-homes/.

Kidney, Sean. *Weekly blog. Climate Bonds Initiative*, May 7, 2015. https://www.climatebonds.net/2015/05/weekly-blog-tfl%E2%80%99s-%C2%A3400m-green-transport-bond-big-success-chinas-first-way-first-ma-green.

Klöpfer, Alexandra. "IFC issues first renminbi-denominated green bonds, supporting China's capital markets and climate-friendly investments." Press Release. International Finance Corporation, June 17, 2014. http://ifcext.ifc.org/ifcext/pressroom/IFCPressRoom.nsf/0/FC77F4FC8451405685257CFA004C56D3.

Koivisto, Marjo. "Urbanization is expensive – Here are 6 innovative projects helping to fund growth in our cities." World Economic Forum, October 6, 2014. https://www.weforum.org/agenda/2016/10/next-generation-urban-assets/.

McKinsey Global Institute. *Bridging global infrastructure gaps*. June 2016. https://www.mckinsey.com/~/media/McKinsey/Industries/Capital%20Projects%20and%20Infrastructure/Our%20Insights/Bridging%20global%20infrastructure%20gaps/Bridging-Global-Infrastructure-Gaps-Full-report-June-2016.ashx.

Montana.gov. Montana Transportation and Land Use. http://www.mdt.mt.gov/research/toolkit/m1/ftools/dei/if.shtml, last accessed May 17, 2018.

Moore, Elaine and Thomas Hale. "UK Sukuk bond sale attracts £2bn in orders." *Financial Times*, June 25, 2014. https://www.ft.com/content/7c89467e-fc4e-11e3-98b8-00144feab7de.

OECD. *Mapping of instruments and incentives for infrastructure financing: A taxonomy*. September 2015. http://www.oecd.org/g20/meetings/istanbul/Mapping-Instruments-Incentives-Infrastructure-Financing-Taxonomy.pdf.

OECD. *Private financing and government support to promote long-term investments in infrastructure*. September 2014. https://www.oecd.org/daf/fin/private-pensions/Private-financing-and-government-support-to-promote-LTI-in-infrastructure.pdf.

Property NSW. *Asset recycling insight report*. October 2016. https://www.property.nsw.gov.au/sites/default/files/Asset%20recycling%20insight%20report.pdf.

Romano, Georges. *Financing via export and agency finance (ECA): Characteristics and benefits*. Citi Group. 2015. http://www.citibank.com/tts/sa/conference/tfc/2015/docs/presentations/0507_georges_romano.pdf.

Suzuki, Hiroaki, Jin Murakami, Yu-Hung Hong, and Beth Tamayose. *Financing Transit-Oriented Development with Land Values*. Washington, DC: World Bank, 2015.

Tae, Moonyoung, Kyungji Cho, and Helen Sun. "South Korea sells first sovereign panda bonds as China opens up," *Bloomberg*, December 14, 2015. http://www.bloomberg.com/news/articles/2015-12-14/south-korea-markets-first-sovereign-panda-bonds-at-3-3-5-percent, last updated December 15, 2015.

U.S. Department of the Treasury Office of Economic Policy. *Expanding our nation's infrastructure through innovative financing*. September 2014. https://www.treasury.gov/resource-center/economic-policy/Documents/3_Expanding%20our%20Nation's%20Infrastructure%20through%20Innovative%20Financing.pdf.

Watson Farley & Williams LLP. *Briefing: Export Credit Agencies and Project Financing*. September 2015. Publication code number: 56818271v1. http://www.wfw.com/wp-content/uploads/2015/09/WFW-France-Energy-ECAandProjects.pdf.

1. McKinsey & Company, *McKinsey Global Institute – Bridging global infrastructure gaps*, June 2016, https://www.mckinsey.com/~/media/McKinsey/Industries/Capital%20Projects%20and%20Infrastructure/Our%20Insights/Bridging%20global%20infrastructure%20gaps/Bridging-Global-Infrastructure-Gaps-Full-report-June-2016.ashx.
2. Ibid.
3. Ambrose, "Senegal issuing second sovereign Sukuk," *Sukuk*, June 29, 2016, https://www.sukuk.com/article/senegal-issuing-second-sovereign-sukuk-4930/.
4. Michelle Froese, "Ontario's Niagara region wind farm inaugurated as part of Global Wind Day," *Windpower Engineering & Development*, June 19, 2017, https://www.windpowerengineering.com/business-news-projects/ontarios-niagara-region-wind-farm-inaugurated-part-global-wind-day/.
5. DW.com, "Australia privatizes busiest container port," September 9, 2016, http://www.dw.com/en/australia-privatizes-busiest-container-port/a-19562476?maca=en-rss_en_news-14963-xml-mrss.
6. New Zealand Government, "New prison's economic impact outlined" (press release), July 13, 2010, https://www.beehive.govt.nz/release/new-prisons-economic-impact-outlined.

Deloitte.