Photo Credit: Image by Freepik

Excavator Image not found or type unknown

Infrastructure Challenges and How PPPs Can Help

Download Chatbot

Infrastructure is critical for economic development, reducing poverty and inequality, creating jobs, and ensuring environmental sustainability. Infrastructure generates high social returns and is welfare enhancing. Governments are ultimately responsible for the provision of public services and the infrastructure required for their delivery. Infrastructure investment is often part of the social compact between a government and its citizens.

Inadequate infrastructure is a constraint on growth and impacts quality of life, particularly in developing countries. When the demand for infrastructure services outstrips supply, congestion or service rationing occurs; the quality of service delivery is low or unreliable, and some areas are simply not served. As of 2016, it was estimated that:

- Over 2.4 billion people lacked access to improved sanitation
- At least 663 million people lacked access to safe drinking water
- Over one billion people lived without access to electricity
- At least one-third of the world's rural population was not served by an all-weather road

Degradation of infrastructure also implies that actual economic growth will be lower than forecasts, as forecasting methodologies typically assume stable infrastructure performance.

Infrastructure investment poses pervasive challenges to governments. First, agency problems involving different actors and taking different forms throughout the project cycle require complex governance arrangements. The agency problems are compounded by the fact that infrastructure projects typically involve large sums of money and are therefore susceptible to corruption and bribery. For example, the politicians and public servants who decide on project selection and implementation as agents of taxpayers and users may be tempted to buy votes with the promise of new infrastructure, even if this means following unsustainable fiscal policies. Gains from the announcement of a project are immediate, whereas the pain will only be felt by electors long after they have cast their vote. Flaws in the incentive framework, and more generally, the rules governing agency problems throughout the project cycle, are a major reason why infrastructure projects often fail to meet their timeline, budget, and service delivery.

Second, most countries are not spending enough to provide the infrastructure needed to reach universal access and meet **the Sustainable Development Goals (SDGs)** (UN SDG) as defined by the United Nations. Moreover, the quality of infrastructure delivery is often disappointing—construction of new assets costs more and takes longer than expected, and service delivery is poor. Finally, infrastructure assets are often poorly maintained, increasing costs and reducing benefits. These issues are discussed further in the report on **Barriers to Infrastructure Service Delivery in Sub-Saharan Africa and South America by Castalia** (Castalia 2014).

The Sustainable Development Goals and PPPs

*World leaders gathered at the **International Conference on Financing for Development** in 2015 and adopted the 17 Sustainable Development Goals (SDGs) and related 169 targets. The **2030 Agenda for Sustainable Development** and the **Addis Ababa Action Agenda** on Financing for Development (FfD) provide the framework for the SDGs. They are intended to galvanize policy makers across the world through concrete targets for the 2015–30 period for poverty reduction, food security, human health and education, climate change mitigation, the construction of resilient infrastructure, and a range of other objectives across the economic, social, and environmental spheres. The SDGs are ambitious—they will require a step change in the level of both public and private investment in all countries. Creative solutions are needed to mobilize private sector investment and innovation, and blend commercial financing with public funding.*

*The **IISD blog on infrastructure's role in the SDGs** highlights that infrastructure is both an explicit and implicit component of the SDGs' goals and targets. Hence, the SDGs may be useful in articulating and rallying support for infrastructure development policy. Goal 9: 'Build resilient infrastructure, promote inclusive and sustainable industrialization, and foster innovation' is particularly relevant. The Addis Ababa Action Agenda emphasizes in paragraph 44 the role of PPPs in support of the 2030 Agenda. Moreover, the SDGs may help clarify the goals, targets, and indicators around which a country will frame its development priorities, including the delivery of public services through PPPs.*

Governments can use the SDGs as a framework to foster an enabling environment for infrastructure investment and set important targets to trigger changes in project selection and design. To meet the SDGs, infrastructure investments must be prioritized based on their environmental, social and economic sustainability. The private sector needs to be incentivized in finding cost-efficient solutions to solve sustainable development challenges. Involving the private sector can help not only to increase the stock of infrastructure assets but also strengthen their resilience, create more sustainable solutions and improve access to infrastructure services. Incorporating sustainability considerations into procurement processes, through project specifications and award criteria, for example, can also enhance the impact of infrastructure investments. The SDGs can also help mobilize high-level political action behind an infrastructure project.

SDG targets often reflect the aims of a specific goal while also reaching across other goals and targets. Thus, a PPP project may address one primary goal and several secondary goals and targets. For example, when considering a potential water PPP, alignment with government strategy to achieve Goal 6 will strengthen the project; at the same time, the project may contribute to reducing the number of deaths and illnesses from hazardous water pollution (Target 3.9), and the proportion of untreated wastewater (Target 6.3). Upgrading an existing wastewater infrastructure should contribute to resource-use efficiency and adoption of environmentally sound technologies and industrial processes (Target 9.4).

Demonstrating infrastructure policy alignment with SDGs may also help governments attract attention and financing from multilateral development banks and funds.

Sources: (UN 2015); (Casier 2015)

Find on this page:

How PPPs can help

PPPs can help overcome some of these pervasive challenges, as illustrated in The Challenges with Infrastructure and How PPPs Can Help. For example:

- Under the right circumstances, PPPs can mobilize additional sources of funding and financing for infrastructure.
- By subjecting potential projects to the test of attracting private finance, PPPs can enhance project selection.
- The incentives of the private sector can be aligned with the interests of the contracting authority throughout the entire life cycle of the project, including the implementation phase. This alignment occurs by tying-in the private operator's revenue to a set of pre-agreed performance indicators and by requiring the latter to invest significant, long-term capital.

Thus, the incentive framework embedded in PPP contracts can foster efficiency gains and those gains should outweigh the additional cost of private finance. When the decision to implement a PPP is based on the government's perceived inability to deliver the service by other means, the PPP route will at least ensure that the service is delivered—but at a higher cost than under efficiency conditions (see Assessing Value for Money of the PPP). The PPP may still be effective, though not efficient.

Countries with relatively long PPP histories have found that PPPs manage construction relatively better than traditional public procurement, with projects coming in on time and on budget more often. This is because of the incentives created by the PPP structure, which give the private party more control over project design and implementation while simultaneously preventing the reward of cost overruns.

The long-term investment horizon of PPP contracts can also help ensure that assets are maintained in a good, serviceable condition.

In fragile and conflict-affected states (FCS), PPP-like structures can help attract private investment and increase service delivery. This is discussed in greater detail in Infrastructure in Fragile and Conflict-Affected States.

The Challenges with Infrastructure and How PPPs Can Help

The mechanisms by which PPPs can improve infrastructure delivery are often called *value drivers*—that is, instruments to maximize value for money. These value drivers—as described in PPP Value Drivers are often integrated into PPP policies.

PPP Value Drivers

PPP value drivers are the mechanisms that can be used to improve value for money in infrastructure provision. They include the following:

- **Whole-of-life costing**—full integration, under the responsibility of one single party, of up-front design and construction with ongoing service delivery, operation, maintenance and refurbishment, can reduce project costs. Full integration incentivizes the responsible party to complete each project phase (design, build, operate, maintain) in a way that minimizes total costs and maximizes efficiency.
- **Risk transfer**—risk retained by the government in owning and operating infrastructure typically carries substantial, and often, unvalued, hidden cost. Allocating some of the risk to a...

PPP value drivers are the mechanisms that can be used to improve value for money in infrastructure provision. They include the following:

- **Whole-of-life costing**—full integration, under the responsibility of one single party, of up-front design and construction with ongoing service delivery, operation, maintenance and refurbishment, can reduce project costs. Full integration incentivizes the responsible party to complete each project phase (design, build, operate, maintain) in a way that minimizes total costs and maximizes efficiency.
- **Risk transfer**—risk retained by the government in owning and operating infrastructure typically carries substantial, and often, unvalued, hidden cost. Allocating some of the risk to a private party which can better manage it, can reduce the project's overall cost to government and minimize risk to the taxpayer.
- **Upfront commitment to maintenance, and predictability and transparency of whole-of-life costs**—a PPP requires an upfront commitment by the private operator to the whole-of-life cost of providing adequate maintenance for the asset over its lifetime. This commitment strengthens budgetary predictability over the life of the infrastructure, and reduces the risks of funds not being available for maintenance after the project is constructed.
- **Focus on service delivery—**allows a contracting agency to enter into a long-term contract for services to be delivered when and as required. The PPP firm can then focus on service delivery without having to consider other objectives or constraints typical in the public sector.
- **Innovation**—specifying outputs in a contract, rather than prescribing inputs, provides wider opportunity for innovation by the private partner. Competitive procurement of these contracts incentivizes bidders to develop innovative solutions for meeting these specifications.
- **Asset utilization**—optimizing the utilization of assets for delivery of additional services leading to multiple revenue streams for the project. For example, the utilization of space in bus terminals for private vendors or unused space for advertisements.
- **Mobilization of additional funding**—charging users for services can bring in more funding, and can sometimes be done better or more easily by private operators than the public sector. Additionally, PPPs can provide alternative sources of financing for infrastructure, where governments face financing constraints.
- **Accountability**—government payments are conditional on the private party providing the specified outputs at the agreed quality, quantity, and timeframe. If performance requirements are not met, service payments to the private sector party may be abated.

The **Partnerships Victoria's Practitioner's Guide** (VIC 2001) published in 2001 clearly set value drivers as the basis for the State of Victoria, Australia's PPP program. **PricewaterhouseCoopers (PWC)'s paper** on the “PPP promise” (PWC 2005, 13–34) and **Deloitte's paper on PPPs** (Deloitte 2006, 5–9) both succinctly describe these benefits of PPPs.

PPP limitations, pitfalls, and complementary measures needed

There are problems that PPPs cannot solve, or that PPPs may exacerbate. First, PPPs may appear to relieve funding problems more than is the case, as government's fiscal commitments to PPPs can be unclear. This can lead to governments accepting higher fiscal commitments and risk under PPPs than would be consistent with prudent public financial management, particularly when PPPs are treated as off-balance sheet. While PPPs can contribute to better project analysis and adoption of innovative solutions that foster efficiency, responsibility for planning and project selection remains primarily with the public sector—moreover, the unclear fiscal costs and contractual inflexibility of PPPs can render these tasks more delicate. The advantages of private sector participation in constructing and managing infrastructure, including improved incentives to carry out regular maintenance, also depend on effective PPP contracting and procurement by the government.

These limitations mean that **PPPs are not a panacea or a remedy for all** infrastructure performance problems. The Challenges with Infrastructure and How PPPs Can Help highlights important ingredients for improved infrastructure delivery. Sound public decision-making based on comprehensive analysis and a governance framework fostering transparency and accountability are prerequisites for successful public investment projects. Evidence suggests that improved management can reduce infrastructure shortfalls by making better use of existing infrastructure facilities and more efficient use of public resources on greenfield projects. Ultimately, many governments may need to commit more resources to deliver quality infrastructure projects.

The four problems with infrastructure project implementation shown in The Challenges with Infrastructure and How PPPs Can Help will be described in this section as well as whether and how PPPs may be able to help, and PPP limitations or pitfalls that may exacerbate the problem.

Key Resources

Infrastructure Challenges and How PPPs Can Help - Problems with Infrastructure

- Foster, Vivien, and Cecilia Briceño-Garmendia, eds. 2010a. *Africa's Infrastructure: A time for transformation*. Washington, DC: World Bank. Presents the results of the Africa Infrastructure Country Diagnostic (AICD) study, a comprehensive review of infrastructure sectors in Africa. Details the challenges facing infrastructure provision in Africa, with information on performance by sector. A French version is also available (Foster and Briceño-Garmendia 2010b).
- OECD. 2007a. *Infrastructure to 2030: Volume 2: Mapping Policy for Electricity, Water and Transport* . Paris: Organisation for Economic Co-operation and Development. Presents the results of a global infrastructure needs study, reviewing trends and challenges in the electricity, water, and transport sectors, and providing policy recommendations. Includes estimates of infrastructure needs in OECD economies, as well as considering the role of PPP in meeting those needs. A French version is also available (OECD 2007d).
- Flyvbjerg, Bent, Mette K. Skamris Holm, and Søren L. Buhl. 2002. "Underestimating Costs in Public Works Project: Error or Lie?." *Journal of the American Planning Association* 68(3) 279-295. This global study of 258 transport projects finds that, on average, actual costs were 28 percent higher than planned costs—65 percent higher for projects outside Europe and North America. The paper describes technical, psychological, and political explanations for this result.
- Flyvbjerg, Bent, Mette K. Skamris Holm, and Søren L. Buhl. 2005. "How (In)accurate Are Demand Forecasts in Public Works Projects? The Case of Transportation." *Journal of the American Planning Association* 71(2) 131-146. This study of 210 transport projects in 14 countries finds that traffic was over-estimated for nine out of ten rail projects, by an average of 106 percent. The accuracy of traffic forecasts also varies for roads, but on average road traffic was found to be under-estimated.
- Flyvbjerg, Bent. 2005. "Policy and Planning for Large Infrastructure Projects: Problems, Causes, and Cures." World Bank Policy Research Working Paper 3781. Washington, DC: World Bank. Summarizes the results and lessons from the above studies, and other similar work—why estimates of costs and benefits are inaccurate for large infrastructure projects.
- Tanzi, Vito, and Hamid Davoodi. 1998. "Roads to Nowhere: How corruption in public investment hurts growth." *Economic Issues* 12. Washington, DC: International Monetary Fund. Drawing on cross-country analysis, argues that corruption reduces growth, by increasing public investment while reducing its productivity—increasing investment expenditure, but with lower expenditure on operations and maintenance.
- WB. 2008. "Deterring Corruption and Improving Governance in the Urban Water Supply & Sanitation Sector: A Sourcebook." Water Working Notes, Note No. 18. Washington, DC: World Bank. Chapter 6 describes the problems of corruption in planning and implementing major capital projects.

- ASCE. 2009. *Report Card for America's Infrastructure*. Washington, DC: American Society of Civil Engineers. Assigns grades and describes the state of different types of infrastructure in the United States. Includes estimates of the cost to users and government of the poor standard of maintenance.
- PWC. 2005. *Delivering the PPP Promise: A Review of PPP Issues and Activity*. New York: PriceWaterhouseCoopers. Section 2 succinctly describes the advantages and disadvantages of using PPPs.
- Deloitte. 2006. Closing the Infrastructure Gap: The Role of Public-Private Partnerships. New York: Deloitte. Examines the case for PPPs, describing the typical benefits of PPP over traditional procurement. Also reviews how PPP markets typically develop, considering PPP experience in several sectors (with a focus on developed countries).
- Engel, Eduardo, Ronald Fischer, and Alexander Galetovic. 2009. *Public-Private Partnerships: When and how*. Santiago: Universidad de Chile. Describes the circumstances under which PPPs may provide better value than traditional public procurement, as well as examining some common but weak arguments for PPPs. Also describes institutional requirements for a successful PPP program.
- Fischer, Ronald. 2011. "The Promise and Peril of Public-Private Partnerships: Lessons from the Chilean Experience." IGC Rwanda Policy Note Series - No. 1. London: International Growth Centre. Uses the experience of Chile and other developing countries to examine the benefits and pitfalls of PPPs, also offering recommendations to address common problems.
- Irwin, Timothy C. 2007. *Government Guarantees: Allocating and Valuing Risk in Privately Financed Infrastructure Projects*. Directions in Development. Washington, DC: World Bank. Chapter 2 describes lessons from history of government guarantees to private infrastructure projects, with cautionary tales of governments thereby creating significant fiscal exposure. Chapter 3 describes why governments can make bad decisions on providing guarantees.
- Sousa, Mariana Abrantes de. 2011. "Managing PPPs for Budget Sustainability: The Case of PPPs in Portugal, from Problems to Solutions." PPP Lusofonia (blog). October 30. Describes Portugal's PPP experience, including the rapid adoption of PPP, without strong fiscal control, and the associated fiscal risk. Also considers how better management of PPPs could contribute to resolving Portugal's external debt problems.
- UK. 2009. *Government Response to Report on Private Finance Projects and Off-Balance Sheet Debt*. London: House of Lords, Economic Affairs Committee. Sets out HM Treasury's response to the Select Committee's report, providing further detail and commentary on the practices and results of PFI in the United Kingdom.
- Gupta, Prashant, Rajat Gupta, and Thomas Netzer. 2009. *Building India: Accelerating Infrastructure Projects*. Mumbai, India: McKinsey & Company. Describes bottlenecks in infrastructure provision in India, and possible solutions, including highlighting some of the benefits of PPPs.
- NAO. 2003b. PFI: Construction Performance. Report by the Comptroller and Auditor General, HC 371. London: National Audit Office. Compares PFI projects in the United Kingdom with an earlier survey of publicly-procured construction projects, and found a higher proportion of PFI projects come in on time and on budget.
- NAO. 2009b. *Performance of PFI Construction*. London: National Audit Office. Updates previous report, adding experience to 2008.
- Duffield, Colin, and Peter Raisbeck. 2007. *Performance of PPPs and Traditional Procurement in Australia: Final Report to Infrastructure Partnerships Australia*. Melbourne: The Allen Consulting Group and University of Melbourne. Compares 21 PPP projects with 33 traditionally-procured infrastructure projects, finding that on average, PPPs have lower cost overruns and delays.
- Duffield, Colin. 2008. *Report on the performance of PPP Projects in Australia when compared with a representative sample of traditionally procured infrastructure projects: National PPP Forum – Benchmarking Study, Phase II*. Melbourne: University of Melbourne, MERIT. Compares 25 PPP projects with 42 traditionally-procured projects' cost and time performance over a series of project milestones.
- Gassner, Katharina, Alexander Popov, and Nataliya Pushak. 2009. "Does Private Sector Participation Improve Performance in Electricity and Water Distribution?." Trends and Policy Options No. 6. Washington, DC: World Bank. A comprehensive econometric analysis of more than 1,200 utilities in

71 developing and transition countries. Found that private sector participation improved efficiency and service levels.

- Funke, Katja, Tim Irwin, and Isabel Rial. 2013. "Budgeting and reporting for public-private partnerships." OECD/ITF Joint Transport Research Centre Discussion Paper 2013 (07). Paris: Organisation for International Co-Operation and Development. Reviews the experience of 65 PPPs in the water sector in developing countries, finding consistent improvements in efficiency and service quality.
- Guasch, José Luis. 2004. *Granting and Renegotiating Infrastructure Concessions: Doing it right*. Washington, DC: World Bank. Describes in detail how poor PPP design and weak implementation can lead to renegotiations and increased costs. Based on a review of experience in Latin America and the Caribbean, where a high proportion of PPPs underwent renegotiation within a short time from contract close.
- Frauendorfer, Rudolf, and Roland Liemberger. 2010. *The Issues and Challenges of Reducing Non-Revenue Water*. Manila: Asian Development Bank. The section on outsourcing of non-revenue water management activities (see pages 34–37) describes how performance-based contracts can be used to help improve maintenance standards.

Related Content

- **INTRODUCTION**
- **PPP BASICS: WHAT AND WHY**
- **What is a PPP: Defining "Public-Private Partnership"**
- **Infrastructure Challenges and How PPPs Can Help**
- **How PPPs Are Financed**
- **ESTABLISHING THE PPP FRAMEWORK**
- **PPP CYCLE**

Additional Resources

- Selected World Bank Tools

Subsections

Image not found or type unknown
Yellow crane

Insufficient Funds

Image not found or type unknown
Blueprints

Poor Planning and Project Selection

Image not found or type unknown
Construction worker

Weak Management

Image not found or type unknown
Steel beams and ladders

Inadequate Maintenance

Image not found or type unknown
Beams

Infrastructure in Fragile and Conflict-Affected States

Image not found or type unknown
Road sign

Climate Change and Natural Disasters

Find in pdf at PPP Reference Guide - PPP Basics or visit the PPP Online Reference Guide section to find out more.