

BRIDGING THE GAP

MEETING THE INFRASTRUCTURE CHALLENGE WITH PUBLIC-PRIVATE PARTNERSHIPS



BCG

THE BOSTON CONSULTING GROUP

The Boston Consulting Group (BCG) is a global management consulting firm and the world's leading advisor on business strategy. We partner with clients from the private, public, and not-for-profit sectors in all regions to identify their highest-value opportunities, address their most critical challenges, and transform their enterprises. Our customized approach combines deep insight into the dynamics of companies and markets with close collaboration at all levels of the client organization. This ensures that our clients achieve sustainable competitive advantage, build more capable organizations, and secure lasting results. Founded in 1963, BCG is a private company with 78 offices in 43 countries. For more information, please visit bcg.com.

The BCG Game-Changing Program

We are living in an age of accelerating change. The old ways are rapidly becoming obsolete, and new opportunities are opening up. It is clear that the game is changing. At The Boston Consulting Group, we are optimistic: we think that the fundamental drivers of growth are stronger than they have ever been before. But to capitalize on this trend, leaders need to be proactive, to challenge the status quo, to make bold moves—*they* need to change the game, too. The decisions they make now, and over the next ten years, will have an extraordinary and enduring impact on their own fortunes as well as on those of their organizations, the global economy, and society at large. To help leaders and to mark our fiftieth anniversary, BCG is pulling together the best ideas, insights, and ways to win—to own the future. This publication is part of that endeavor.



BRIDGING THE GAP

MEETING THE INFRASTRUCTURE CHALLENGE
WITH PUBLIC-PRIVATE PARTNERSHIPS

MARCO AIROLDI

JEFFREY CHUA

PHILIPP GERBERT

JAN JUSTUS

RAFael RILO

CONTENTS

- 3 INTRODUCTION**
- 5 PUBLIC-PRIVATE PARTNERSHIPS COMMAND GROWING ATTENTION**
 - The Infrastructure Gap
 - Forging the Solution
- 9 A WINNING STRATEGY FOR THE PUBLIC SECTOR**
 - Best Practices Throughout a Project's Life Cycle
 - Cultivating an Enabling Environment
- 18 THE PRIVATE-SECTOR PIECE OF THE PUZZLE**
 - Assess Risk Across the Entire Portfolio of Projects
 - Manage Risk in the Bidding and Contract Negotiation Phases
 - Select Partners That Can Fill Critical Needs
 - Control Construction Risk
 - Manage Operations and Financial Risks
 - Shape Public Perception
- 24 THE WAY FORWARD**
- 25 FOR FURTHER READING**
- 26 NOTE TO THE READER**

INTRODUCTION

THE NEED FOR INFRASTRUCTURE investment around the globe is climbing. In emerging markets, population growth, increasing urbanization, and rising per capita incomes are driving the demand for new roads, power stations, schools, and water delivery systems. In the developed world, including the United States, significant reinvestment in aging infrastructures is becoming urgent. But this need for infrastructure investment comes in the wake of a financial crisis that has severely constrained public budgets in many countries. The result: a staggering gap of approximately \$1 trillion to \$1.5 trillion annually between demand and investment in infrastructure.

Public-private partnerships (PPPs) will increasingly play a crucial role in bridging the gap. These partnerships—in which the private sector builds, controls, and operates infrastructure projects subject to strict government oversight and regulation—tap private sources of financing and expertise to deliver large infrastructure improvements. When managed effectively, PPPs not only provide much needed new sources of capital, but also bring significant discipline to project selection, construction, and operation.

Successfully forming and managing PPPs, however, is no small feat. For one thing, governments, accustomed to focusing on delivering services, need to change their mindset and begin viewing these partnerships as a product that they must develop, market, and sell to potential private-sector partners. At the same time, both the public and private sectors must overcome the challenges created by an inherent conflict between their respective objectives: the public sector wants to minimize total or overall economic costs and ensure the delivery of high-quality service, while the private sector aims to maximize returns.

If not managed properly, that conflict can wreak havoc. In Latin America, for example, many PPPs have had to be renegotiated, a development that often results in greater costs to taxpayers. And in the United Kingdom, the government's first private-finance initiative was criticized for, among other things, failing to deliver good value for taxpayers' money.

Such stumbles, however, are not inevitable. Drawing on ten years of experience in advising both governments and private-sector companies, The Boston Consulting Group has identified a series of best practices that underlie successful PPPs.

The best practices for the public sector apply to every stage in the formation and implementation of a PPP, from selecting and designing

the project, to developing a regulatory structure and a transaction process, to supervising the concessionaire (the private company entitled to temporarily own and operate the asset) throughout the project's life cycle. In addition, public-sector leaders must take concrete steps to cultivate an environment in which PPP projects can flourish, such as securing the right project-management expertise within the government and employing policies that support a vibrant industry of engineering and construction companies as well as other private-sector partners, such as financiers.

Meanwhile, the private sector needs to develop a sophisticated approach to managing the myriad risks that PPPs present, from the political risks associated with a change in government policy to the risk of setbacks in financing or construction delays.

Leaders in both the public sector and the private sector who follow the steps outlined in this report will significantly increase the odds of making PPP projects a success. And as the demand for infrastructure investments rises while public funding remains constrained, well-designed PPPs will emerge as a critical tool for helping countries around the world advance their growth prospects and raise the standard of living for their citizens.

PUBLIC-PRIVATE PARTNERSHIPS COMMAND GROWING ATTENTION

GOVERNMENT LEADERS IN MANY parts of the world are taking a greater interest in public-private partnerships. Such partnerships—in which the private sector builds, controls, and operates infrastructure projects with strict government oversight and regulation—tap private sources of financing and expertise to deliver large infrastructure improvements. (See the sidebar “Defining a Public-Private Partnership.”) This heightened interest is particularly keen in emerging markets where, aside from a dip in activity following the 2008 financial crisis, the number of PPPs has continued to climb over the past decade. In the developed world—including the United Kingdom, Canada, and Australia—interest continues to grow in using PPPs to boost infrastructure invest-

ment. Still, political concerns, including a negative view of infrastructure privatization in some markets and sectors, have limited the use of PPPs in many other developed countries.

The Infrastructure Gap

The need for significant infrastructure spending is mounting worldwide. According to a BCG analysis (which is partly based on an assessment by the Organisation for Economic Co-operation and Development), the demand for investment in areas such as energy, transportation, water, waste, and social infrastructure (such as hospitals and schools) is expected to hit an average of \$4 trillion annually between 2011 and 2030.

DEFINING A PUBLIC-PRIVATE PARTNERSHIP

The level of private involvement in infrastructure projects varies, but increasingly, investment and operational responsibility and risk are being transferred to private partners via operations and maintenance contracts, leases, concessions, and privatizations. For the purposes of this report, we define public-private partnerships rather narrowly. We characterize PPPs as relationships in which construction and operation are bundled,

private companies have temporary control of assets, and both public and private entities share some degree of risk.¹

NOTE

1. See Eduardo Engel, Ronald Fischer, and Alexander Galetovic, “The Basic Public Finance of Public-Private Partnerships,” Cowles Foundation Discussion Paper No. 1618, January 2011.

Powerful forces are behind this surge in demand. The key drivers in emerging markets are a growing population, urbanization, and rising per capita incomes. In the developed world, continued increases in travel and the flow of goods are straining aging transportation infrastructures, which are often poorly maintained and already in need of upgrades to meet heightened safety and quality requirements. At the same time, a push toward low-carbon economies and energy independence in developed markets is driving investments in renewable-power generation, grid infrastructure, and oil and gas exploration and transport.

Infrastructure construction activity, meanwhile, is not keeping pace with the demand. In fact, the rate of infrastructure spending relative to GDP has declined in most developed countries over the past 40 years. And between 2008 and 2010, infrastructure investments around the world averaged only \$2.7

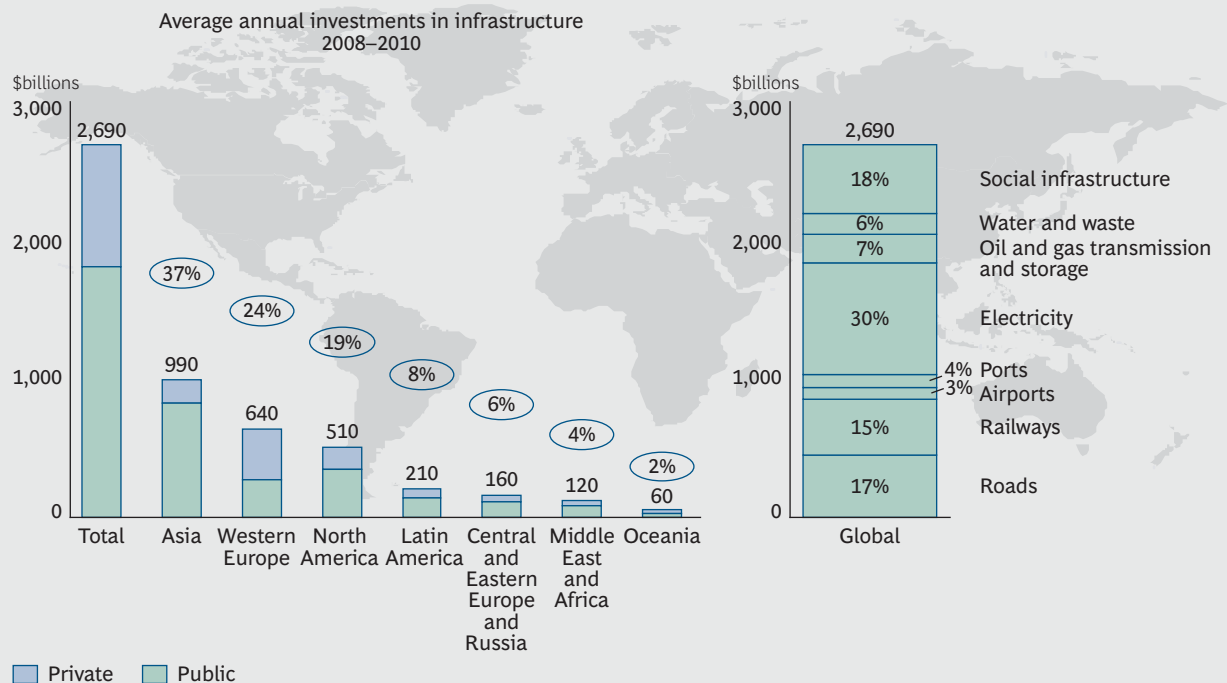
trillion annually, according to a BCG analysis based on data from IHS. (See Exhibit 1.) The largest spending in that period occurred in Asia and was driven by the booming and urbanizing economies of China and India, with electricity, road, and railway investments accounting for just over 60 percent of the total. The upshot: an estimated gap of \$1 trillion to \$1.5 trillion annually between demand and investment in infrastructure between now and 2030. (See Exhibit 2.)

This shortfall has significant real-world implications. Major repercussions result when critical infrastructure systems fail, such as when bottlenecks occur because ports cannot handle shipping demand and when power systems cause frequent blackouts that cripple local manufacturers. Key business leaders around the globe have been quite public about their dissatisfaction with the state of their respective countries' infrastructures. Their concern reflects the fact that a subpar

EXHIBIT 1 | Global Infrastructure Investments Average \$2.7 Trillion per Year

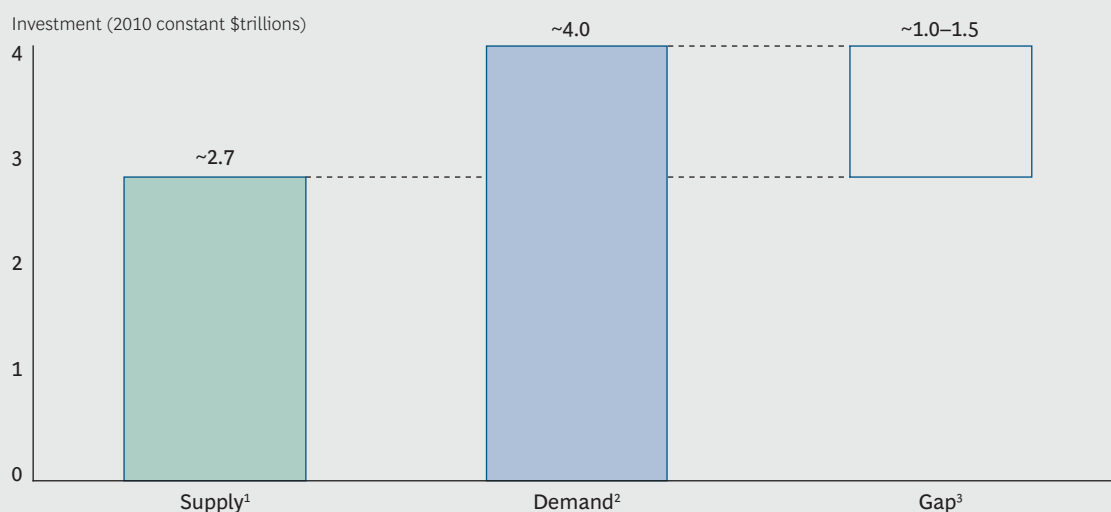
The largest infrastructure investments are concentrated in Asia

Electricity, roads, and railways constitute more than 60 percent of global infrastructure investment



Sources: IHS, World Economic Forum, The World Bank Group, International Monetary Fund, European Investment Bank, Vnesheconombank, Morgan Stanley, Deutsche Bank, ICBC, CIBC Rosstat, U.S. Census Bureau, Programa Nacional de Infraestructura, BCG analysis.
Note: Data presented for 69 countries, which account for approximately 96 percent of world GDP. Possible overestimation of private participation, particularly in Western Europe, due to varying classification methodologies used by different sources. The largest economies without data on public investments are Japan, South Korea, the Netherlands, and Turkey.

EXHIBIT 2 | The Gap Between Infrastructure Supply and Demand Ranges from About \$1 Trillion to \$1.5 Trillion per Year



Sources: IHS; OECD; IEA; Economist Intelligence Unit; BCG analysis.
¹Estimate based on historical share of GDP invested in infrastructure.
²Estimate based on macroeconomic models.
³Difference due to growth in demand and historical underinvestment.

infrastructure reduces a nation’s competitiveness, dampens economic growth, and is a barrier to social progress.

Yet daunting fiscal challenges complicate the task of reducing the infrastructure spending gap with public funds because government vaults are, in many cases, depleted in the wake of the global financial crisis. Private investors, however, are hungry for an opportunity to put some of their money to work in infrastructure projects. And the supply of private-sector capital is significant: as of 2010, insurance companies, pension funds, and sovereign-wealth funds held assets under management of \$22 trillion, \$19 trillion, and \$4 trillion, respectively. In today’s environment, with fixed-income returns at extremely low levels, those institutions are looking for alternative investments. A 2012 survey by Russell Investments found that 28 percent of the 146 global institutional investors surveyed expected to increase their investment in private infrastructure, while 12 percent expected to increase their investment in public infrastructure. Indeed, many pension funds have set up teams that specialize in infrastructure investments. However, those funds have clear financial targets and thus are appropriate candidates for partnering with public entities only if the

details of a particular project meet the corresponding fund’s criteria.

Forging the Solution

In this environment, it is hardly surprising that strong interest in PPPs continues to grow. When managed well, such partnerships have three major advantages over traditional public infrastructure projects. First, project selection is more rigorous because private-sector companies bid only on contracts that demonstrate a solid business case, therefore making white-elephant projects unlikely. Second, the private capital that PPPs attract provides a critical advantage for governments facing short-term budget pressures. And third, private companies have an eye toward profit, giving them a strong incentive to leverage their expertise in planning, development, and execution to manage costs well and maximize revenue. The result can be projects that produce the greatest impact for funds invested.

Of course, a PPP’s payoff hinges on how effectively it is executed. One particularly high-profile example illustrates some potential pitfalls. In the United Kingdom, critics of the government’s private-finance initiative argued not only that it produced poor value for taxpayers’ money but also that it was fre-

quently driven by the government's desire to create off-balance-sheet financing mechanisms for projects. In response, the government unveiled a new PPP scheme that, while fundamentally unchanged, aims to address some of those problems. For instance, it offers increased transparency on off-balance-sheet liabilities and requires the private sector to provide equity-return information.

Projects in emerging markets have been plagued by difficulties as well. An analysis of more than 1,000 concessions in Latin America between 1985 and 2000 showed that 55 percent of transportation concessions and 74 percent of water concessions were renegotiated just 2.2 years, on average, after being awarded.¹

The renegotiations are a sign that the original deal structure did not work.

Such difficulties, of course, are not unavoidable. When the public sector and the private sector each adopts proven best practices, projects can deliver both the desired performance for the public and a reasonable return for private companies.

NOTE

1. See J. Luis Guasch, *Granting and Renegotiating Infrastructure Concessions: Doing it Right* (Washington, D.C.: The World Bank, 2004).

A WINNING STRATEGY FOR THE PUBLIC SECTOR

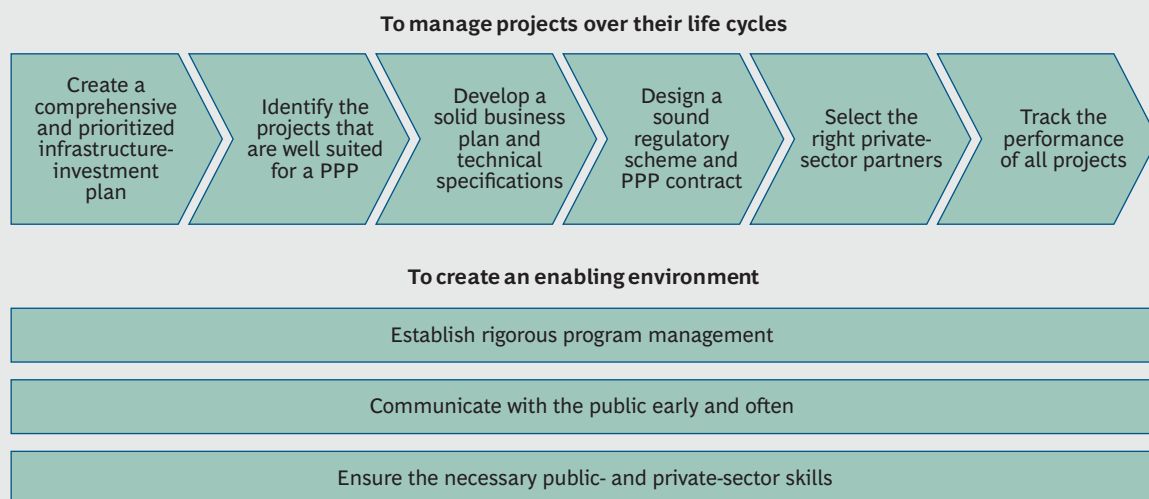
UNDERSTANDING WHAT DIFFERENTIATES SUCCESSFUL PPPs from failures is crucial for mitigating problems. Drawing on extensive work over the past decade, BCG has identified a series of best practices to help leaders successfully design and implement such partnerships. In addition to embracing these best practices, public-sector leaders must also address another critical—but often overlooked—driver of success: creating an environment that allows PPPs to succeed. This includes securing the right project-management expertise within the government

and employing policies that support the growth of a robust private sector so that partners in both sectors have the right skills to make PPPs work. (See Exhibit 3.)

Best Practices Throughout a Project’s Life Cycle

Fully realizing a PPP’s potential requires focus and discipline every step of the way. Employing the following proven best practices along the entire life cycle of an infrastructure investment project, from project prioritiza-

EXHIBIT 3 | PPP Best Practices for the Public Sector



Source: BCG analysis.

tion to rigorous contract monitoring, will help public-sector leaders avoid many of the worst potential traps.

CREATE A COMPREHENSIVE AND PRIORITIZED INFRASTRUCTURE-INVESTMENT PLAN

The first order of business in infrastructure investment is to make sure that the right projects are being green-lighted; this is especially important in today's budget-constrained environment. Rather than start with a series of one-off projects, therefore, governments should devise a well-thought-out infrastructure master plan that will produce a transparent pipeline of projects. The plan should be based on a long-term agenda for economic development and must factor in the strategic infrastructure investments that should be funded to make the economic vision achievable. The most effective master plans will have clear targets for improvement in everything from roads to renewable-energy generation and will have been crafted with input from all crucial constituencies, including citizens and business leaders.

Devise a well-thought-out infrastructure master plan to produce a project pipeline.

Several countries have employed this systematic approach. The Indonesian government, for example, has developed a pipeline of infrastructure projects based on its Masterplan for Acceleration and Expansion of Indonesia Economic Development 2011–2025. The blueprint outlines how Indonesia will transform into an advanced economy over a period of 15 years, and it calls for developing six “economic corridors”—regions that focus on specific industries. Investment projects, then, are developed based on the type of infrastructure, such as roads or ports, that would be needed to support those industries.

Locking down new infrastructure projects to address a country's needs and goals is obviously important. But just as important is determining whether upgrades to existing infrastructure could deliver the same payoff.

Sometimes relatively simple improvements to an existing infrastructure asset can significantly increase capacity in less time and for less money than would be required for complex new projects. The operator of an airport in Italy, for example, redesigned the facility's tariff scheme to motivate users to take off and land during less busy periods and to favor large airplanes—a move to increase the throughput of the airport's limited runway capacity. In the United States, the government has been able to avoid making improvements to its aging electricity transmission and distribution grid by establishing the largest global market for demand response. Under this approach, energy-intensive businesses, such as commercial refrigeration facilities, accept a payment in return for temporarily shifting some of their electricity use during peak demand times. The resulting elasticity of demand in the power sector limits the need for investments to handle absolute peak levels.

IDENTIFY PROJECTS THAT ARE WELL SUITED FOR A PPP

Once an infrastructure project has been selected, the key question is whether it should be a public-sector-only venture or if the private sector should play a role. That decision must be based on an objective analysis of the cost and benefits to the taxpayer of both approaches.

But such an analysis, of course, is easier said than done. Many countries do not conduct these assessments in any systematic way. And even when they try, they often encounter significant stumbling blocks, including lack of expertise, a dearth of solid data, and inconsistency in the way that key assumptions in the analysis are made. Such assessments have frequently been criticized later on for unduly favoring PPPs.

Governments need to invest in three areas to ensure that they can evaluate projects with the necessary rigor. First, they should train the right people and develop the appropriate systems for conducting these evaluations. One approach is to create new units within a government that have the experience and tools to conduct these analyses. Initially, it may make sense to tap outside experts to

lead the effort while training in-house staff along the way.

Second, governments must develop benchmark databases that collect cost information on both public and PPP infrastructure projects. This information, which should include not only the capital expenditures for developing a project but also the cost of operating the project over its life cycle, will drive the projected cost analysis of similar projects. An Asia-Pacific government developed a database of road construction projects for just this purpose.

And third, governments need to develop standardized methodologies for making these assessments and identify a source of common key assumptions, such as what the financing costs would look like under a public-sector approach versus a private-sector approach.

DEVELOP A SOUND BUSINESS PLAN AND TECHNICAL SPECIFICATIONS

Once the numbers show that a PPP makes sense for a particular infrastructure project, developers must address two key areas. The first is the business plan, which should include considerations such as how much traffic a new road is projected to carry or what ancillary revenue sources can be tapped. The second is the actual technical specifications of the project. These specifications are determined by the key requirements of the asset, such as the desired maximum passenger capacity of a new railway system or how fast the trains that travel on it must be able to go. Failure to plan effectively on either front can lead to major problems, including long—even indefinite—delays in construction or difficulties once the project is operational.

Crafting a sound business plan requires avoiding some common stumbling blocks, such as overestimating demand. A 2005 analysis of 104 toll-road projects by Standard & Poor's, for example, found that forecasts for traffic exceeded actual first-year traffic by 20 to 30 percent, on average.¹ When demand is overestimated, projects may fail to deliver the expected revenues. And it is nearly impossible to obtain either bank or private financing for a project that does not include solid demand forecasts with sensitivity analyses on

key risks, such as a rise in raw-material costs or changes in levels of demand. The contract design and the regulatory structure should also factor in uncertainty in those areas, and partners should share the positive and negative consequences of risks that are difficult to manage.

Partners should share the consequences of risks that are difficult to manage.

The various regulatory and legal hurdles that a project must clear can present additional complications. The hurdles include obtaining environmental, operating, and right-of-way permits; acquiring land; and establishing the road or railway networks needed to access and support an infrastructure project. Failing to promptly sort out these prerequisites can cause interminable delays and lead to soaring costs as resources are tied up in unproductive assets for extended periods. Projects in which the public sector takes the lead on regulatory and legal aspects tend to run more smoothly, since the government typically has more control over them. In Indonesia, for example, the government must complete all land acquisition for a PPP project before a private-sector partner can be selected.

Technical specifications can also derail a project. A common problem is to focus primarily on how the project will be constructed (input-based specifications) rather than on the performance and capacity of the completed asset (output-based specifications). While focusing on input-based specifications provides comparability across different private-sector bids and ensures that public-sector design concerns will be taken into account, doing so limits the ability of the private sector to innovate and propose alternative, potentially more cost-effective, solutions.

This point was not lost on the developers of a PPP for a convention center in India. In setting requirements for the project, the government specified only one primary output requirement: the minimum capacity of the

convention hall. The private sector then came up with a design that not only met the goal but also included a way to integrate commercial opportunities, such as food and beverage purveyors and hotels. To take another example, consider the advantages that might accrue if the proposal for an urban transport corridor called for a broad, output-based specification of the number of passengers that the corridor must be able to handle rather than a more restricted specification. In that case, the private-sector company could then determine what kind of vehicle—bus or tram, for example—would be best suited for the project.

Private-sector experts can help vet the business plan and technical specifications.

Another problem is so-called gold plating, where designers augment a project's performance requirements beyond what is really needed. Often they do so either because they want performance to err on the side of exceeding expectations rather than failing to meet them or because they lack an understanding of how certain changes to the design will inflate costs.

To avoid this trap, designers need to clearly examine the tradeoffs between enhanced performance capabilities and the increased costs of those features over the life cycle of a project. And there should be a strict process for controlling changes to the specifications throughout design and construction. Private mining firms that have invested heavily in port, railway, and road projects, for example, have saved millions of dollars after closely comparing project specifications with actual needs. Consider the savings, for instance, if initial plans call for service access roads on both sides of a railway line, but a cost-benefit analysis determines that a road on only one side would be sufficient.

Involving experts from the private sector early on can help in vetting both the business plan and the technical specifications of a

project. Before sending a proposed PPP out for bids to the private sector, government planners should have candid conversations with companies that could potentially deliver such projects. Their feedback may make a project plan more cost efficient.

DESIGN A SOUND REGULATORY SCHEME AND PPP CONTRACT

The details concerning a physical asset—a road or bridge, for instance—constitute only half the equation. The other critical element of a PPP comprises the regulatory structure and the contract details that make up the ground rules for everything from pricing, to risk allocation between the private and the public sector, to how investment requirements are set. Flawed regulatory models, which often fail to create an effective balance of risk between private and public partners, can deter investors, cause major problems once a project has become operational, and damage a government's prospects for creating future PPPs.

To ensure that a regulatory scheme is sound, designers should seek input from key groups that have a stake in the project. Developers of the regulations for an Asian airport, for example, made sure to involve a group of diverse stakeholders in workshops and interviews. The stakeholders included users of the new asset, government ministries with oversight of the sector, and organizations—both public and private—engaged in similar projects. Since initial sessions focused on the key objectives and basic principles of the regulatory arrangement, planners avoided getting bogged down in minutiae, such as how pricing or service levels would be set. The agreed-upon principles of the broad regulatory structure then served as guidelines for later development of the regulatory details.

External regulation benchmarking can help get a PPP off to a good start. Creating effective regulations involves choosing among many different options, such as how and when companies will be reimbursed for future expansion and upgrade investments. Understanding the available options and studying how effective they have proven to be in other situations, therefore, is critical.

Investments in electricity and gas networks, for example, are strongly influenced by the tariff regulation, which determines the return on the investments. Governments, therefore, need to carefully assess the impact of tariff regulation on network quality, on the nation's GDP (which rises when investments increase), and on affordable end-user prices. Moreover, when setting up and regularly reviewing the key parameters of the regulation framework, governments should conduct broad benchmarking of international options and assess the impacts that have resulted from implementing those options.

Allocating risk between the public sector and the private sector is a fundamental element of any regulatory and contract design. Generally, the idea is to assign a specific risk to the partner that is better equipped to handle it. Often, this is easy to determine. Construction risks, for example, are typically better managed by companies in the private sector that have extensive experience managing large construction projects, while the risk of available network access (such as a road that provides access to a port) can be better controlled by the public sector, which usually governs those systems. Assigning other risks, however, may depend on the specific context or the results of negotiation. Volume risks or macro risks (such as inflation, exchange rates, or a force majeure), for example, can be allocated to either the private sector or the public sector—or even be shared by the two.

Because PPPs are long-term contracts, certain risks will materialize only after a number of years. It is usually best to apportion those risks, at least to some degree, with provisions for sharing upsides and downsides in areas such as core and ancillary business revenues, financing costs, and commodity costs. This apportionment can take different forms, such as sharing every dollar gained and lost or assigning all risks and benefits to the private sector but capping the total to avoid excessive gains or losses. Such provisions often reduce the need for painful renegotiations.

Another critical element is balancing the need to safeguard the public's interests with the need to attract—and hold on to—private-sector financing. Since many infrastructure

projects constitute significant monopolistic public assets, the government often wants to be able to intervene to protect the public's interests—for example by mandating investments that will be critical for satisfying the future demands of users. Provisions in the contract should allow for safeguarding only when absolutely necessary and then balance that constraint with appropriate rewards for the private sector.

Consider a termination clause often included in airport concession agreements, for instance, which gives the state the right to take over the facility if the operator doesn't meet certain levels of performance. The operator, in turn, is protected from politicized or opportunistic evocations of the clause by being guaranteed a fixed period, usually 12 to 18 months, during which the company can try to fix the performance problems. What's more, even if the operator fails to remedy the problems and the contract is terminated, the company must be compensated adequately. Typically that compensation equals the fair market value of the asset minus some penalty for the poor performance, with the figures predetermined by a previously agreed-upon methodology.

The public's interests must be balanced with the need to attract private financing.

Finally, the government must be very clear about whether or not it intends to initiate new projects that may compete with the current project at some point in the future. While the government may view the construction of competing facilities as a way to exact better performance from operators, such a move would also reduce the return that those operators earn. Not surprisingly, private-sector partners would want to pay less for the right to operate an asset under those conditions than they would for projects where freedom from future competition is guaranteed. Thus the government needs to decide, from the start, whether the primary goal is to preserve some flexibility down the

road or to garner the highest possible price from the private-sector partner. (For further details on economic regulation, see “Built to Last: A Win-Win Approach to Regulating Public-Private Partnerships,” September 2012.)

SELECT THE RIGHT PRIVATE-SECTOR PARTNERS

Finding the right partner is not a matter of simply putting a contract out for bid and waiting for proposals. Governments must create a clear, competitive, and transparent process that encourages participation from many potential private-sector partners. That means being very clear about what the requirements are, including the timeline for the selection, the milestones that must be reached during the bidding process, and the criteria on which bids will be judged. Too often, bidders don’t know which factors are the most important in selecting a winner. Running the selection process in such a professional manner not only ensures a large pool of well-qualified bidders but also lays the groundwork for a productive relationship with the winner.

Governments must create a clear, competitive, and transparent bidding process.

To attract as many qualified bidders as possible, the government should actively seek out domestic and international bidders. In addition, the bidding process should start with a preselection round that does not require bidders to pony up a steep investment. Given that the tab for putting in a formal bid may top \$10 million, many companies won’t participate if the contract size is too small or their chance of winning too slim. The initial round should draw a large pool of applicants that make a preliminary bid, and then a smaller group, often three to five companies, should be selected to move ahead with a final, detailed bid.

The evaluation of those bids must be conducted by an experienced team, which may comprise a mix of government officials and outside experts. The team should follow the

bidding rules strictly, and the process should be as transparent and public as possible. Failure in either regard will often lead to contested outcomes. Case in point: In India in 2005, preliminary contract awards for the modernization of the Delhi and Mumbai airports were rejected not once, but twice. A board established to look into the matter found, among other things, that there were technical flaws in the evaluation of the bids and that one bidder was treated more favorably than others.

Finally, governments must protect against the tendency among some bidders to low-ball their offer. Some companies deliberately propose an initial price that is highly favorable to the government but then attempt to renegotiate the arrangement down the road. To avoid this, selection processes should not focus exclusively on price. Instead, they should use criteria that take into account the capabilities and reputation of the potential private-sector partner. This is particularly critical in situations where the infrastructure asset will have a monopolistic market position. In addition, imposing common demand assumptions, applying strict prequalification criteria for bidders, and passing legislation can also help protect against overbidding. A law recently enacted in Colombia, for example, requires that a project be put out for bid again if, under the first deal, the government would need to increase its funding contribution by more than 20 percent above the original plan.

TRACK THE PERFORMANCE OF ALL PROJECTS

PPPs are long-term partnerships that will often last more than 20 years, so keeping a close watch on how well the operation of the project is going is critical. A government should dedicate resources to this effort and establish a team to monitor performance over time. This entails identifying the set of sector-specific KPIs that should be tracked, such as the System Average Interruption Duration Index (SAIDI), which is used to track the availability of electric power for consumers. Monitoring KPIs through a risk management system will allow the contract team or regulating authority to spot problems early on and take steps (which should already have been outlined in a contingency plan) to remedy the situation.

Even with a well-thought-out contingency plan, however, making changes to a PPP agreement may be necessary. After all, it is impossible to account for every potential development in advance. At a minimum, however, the contract should spell out what sorts of events trigger renegotiation, exactly how renegotiation will be conducted, and how disputes will be resolved.

In an Asian country, for example, an airport regulation clearly lays out the process for resolving conflicts between the airport and the airlines and between the airport and the civil aviation authority. In both cases, an arbiter will first assess whether or not a complaint requires investigation. If it does, the arbiter may appoint an independent advisory panel for appeals—with the arbiter covering the cost of that panel—to recommend a decision. The entire process aims for a swift resolution: within ten to 13 weeks.

One of the most valuable—though frequently overlooked—steps in the PPP process is determining whether a partnership is delivering the expected value for money and what has worked, or not worked, so far. Governments should allocate resources for these analyses, which can start as early as one or two years after a PPP begins operating. (Eventually an evaluation across the entire life cycle of the project will be essential.) Questions such as whether the project was designed correctly, whether demand fell into expected ranges, and whether renegotiation was required should be answered with an eye toward improving the future structure of PPPs.

Cultivating an Enabling Environment

Governments cannot execute best practices effectively without the right resources and expertise. These include proven program-management skills for driving the entire PPP process, effective communications strategies for managing potentially controversial projects, and legal and institutional frameworks that pave the way for the partnerships. We have identified three crucial steps that governments must take to create the right environment for supporting and driving PPPs.

ESTABLISH RIGOROUS PROGRAM MANAGEMENT

Setting up a PPP is a massively complex undertaking that involves large numbers of people—from government officials to engineering experts to financial and legal advisors. At the same time, multiple work streams must be managed, and systems must be created for tracking performance. It is crucial to use tools and methodologies, such as rigorous program management (RPM), to direct the entire effort effectively.

Rigorous program management ensures sound governance and transparency.

RPM drives three crucial elements of the PPP effort. First, it ensures sound governance, including the establishment of a fast and effective decision-making process involving important stakeholders, the creation of a program management office to drive and control the overall process, and the definition of a single point of accountability for each work stream. Second, it ensures transparency regarding the project's status by requiring monitoring of its most critical elements. A standardized, exceptions-based reporting system, for instance, can identify anomalies that may be indicative of a significant problem. And third, it identifies potential stumbling blocks early in the process.

COMMUNICATE WITH THE PUBLIC EARLY AND OFTEN

Almost every infrastructure project will encounter criticism, often from people living near the proposed site. A public uproar is most likely to occur when consumers are being required to pay for services that were previously free or subsidized, as was the case with the M6, the first toll highway in the United Kingdom. In fact, that project faced so much public opposition that it was delayed by many years.

A proactive communications plan that makes a solid case for the PPP while giving concerned citizens a voice in the process can

help mitigate criticism. The plan should highlight favorable case studies and explain the benefits that underscore the value of the project. It should also include an explanation of how the government will protect the public's interests, particularly with regard to safety, environmental, and financial concerns. For example, the key to overcoming resistance to user charges for a new roadway is to demonstrate that travelers will enjoy a clear improvement in quality (fewer traffic jams at rush hour and better driving conditions, thanks to a larger, freshly paved road). While this process cannot address every issue or demand raised by the public, it does help smooth the way when people see that their concerns are being heard and sincerely considered. Too often, the importance of this process is overlooked, and communications efforts are allocated little in the way of resources or professional planning.

ENSURE THE NECESSARY PUBLIC- AND PRIVATE-SECTOR SKILLS

For a PPP to succeed, the government needs to have a series of key levers in place. These include the in-house skills to manage the process, the funds to pay for the upfront costs of preparing and developing the partnerships, and the appropriate legal frameworks and

regulatory institutions to make the project feasible. Securing these levers can be particularly challenging in emerging markets, where government institutions may not be well established and, in some cases, may also be starved for resources. Creating a PPP unit, which serves as a center for PPP expertise in a country, can be most helpful for building expertise. (See the sidebar “The Value of PPP Units.”)

PPP units can serve to centralize and build PPP expertise in a country.

At the same time, it is important to recognize that PPPs aren't cheap. To create a viable commercial and technical plan that is likely to attract experienced private-sector bidders and result in a fair shake for taxpayers, governments must often tap outside experts and advisors. The tab for such feasibility and project-structuring work regularly amounts to 2 to 5 percent of the total capital expenditure for a project. Budget-constrained governments often either do not have the funds to pay for that upfront investment or their bud-

THE VALUE OF PPP UNITS

PPP units come in different forms with varying responsibilities. Some are run by the government, while others are controlled by nongovernmental organizations. Infrastructure Australia, for example, was established by the Australian government to develop national PPP guidelines and frameworks, to help prioritize infrastructure investments for the central government, to provide advice on policy and regulation, and to promote the Australian PPP market at the federal level. Its activities are complemented by state-level PPP units, such as Partnerships Victoria, that provide technical assistance for specific projects.

Some PPP units have not quite become the “islands of excellence” that governments

may have hoped they would, but their efforts offer valuable lessons nonetheless. First, PPP units should be crafted with a focus on making up for whatever shortcomings may exist in a government's skill set, such as a weakness in financial modeling or in drafting PPP contracts. And second, a PPP unit should be allied with an existing, politically powerful organization—often the treasury department—in order to give the unit the attention and political clout it will need. Centralizing PPP experience upgrades and consolidates scattered, subcritical skills and helps a country improve its capability, guidelines, and processes across the board.

get allocation is biased toward construction rather than preparation.

Therefore, project preparation facilities, which consist of funds specifically set aside to explore the feasibility of PPPs and to prepare them rigorously, can make a big difference. A government in Southeast Asia established such a facility as part of an overall effort to enhance its PPP capabilities. The facility was designed to ensure sustainable funding for the upfront preparation of PPPs and is currently being used to fund two of the country's high-priority infrastructure projects.

PPPs need legal and regulatory support as well. For example, there must be laws on the books that grant the government the ability to form partnerships with companies in the private sector. And independent regulatory institutions, which are scarce in many emerging markets, must be established and staffed to oversee projects throughout their life cycles.

Less obvious, but also important, is the effort that the government should make to encourage the growth of strong private-sector partners in the first place. To flourish, PPPs need a robust private sector that harbors engineering expertise and skilled labor. Governments, therefore, should promote the development of that market, whether by boosting education, implementing policies to encourage foreign direct investment, or creating anticorruption initiatives.

NOTE

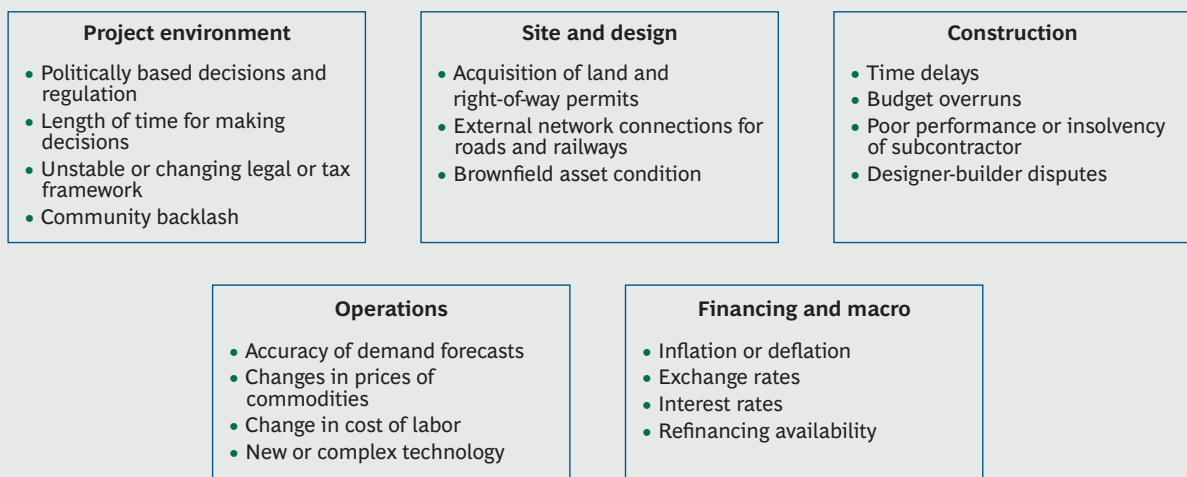
1. See "Traffic Forecasting Risk Study Update 2005: Through Ramp-Up and Beyond," Standard & Poor's, August 25, 2005.

THE PRIVATE-SECTOR PIECE OF THE PUZZLE

FOR THE PRIVATE SECTOR, the biggest challenge in creating successful PPPs is to identify and manage risk across the entire life cycle of a project. (See Exhibit 4.) Many of the risks are in addition to those found in publicly procured infrastructure projects, and they therefore pose particular challenges to private-sector companies.

- *Project Environment.* These risks arise from the political and legal environments in which the project operates. They include the risk of government decisions that are aimed at making users (and voters) happy but that penalize private-sector partners.
- *Site and Design.* These include obtaining the necessary permits and rights of way for construction and operation.
- *Construction.* Construction risks can be significant, particularly as projects become larger and more complex or involve new technologies.
- *Operations.* Given the long-term nature of PPP contracts, operations risks, such as

EXHIBIT 4 | A Broad Set of Risks Must Be Managed Over a Project's Life Cycle



Source: BCG analysis.

the possibility that the demand forecast for a road or bridge turns out to be overly optimistic, are a real concern.

- *Financing and Macro.* These risks include the possibility that loans will have to be refinanced at rates that have risen higher than anticipated.

While there is no way to eliminate risk, BCG has identified six best practices that can help companies understand a project's vulnerabilities and minimize risk where possible. This understanding not only allows for competitive bids and fact-based negotiations but also helps private-sector companies avoid contracts with unreasonable levels of risk.

Assess Risk Across the Entire Portfolio of Projects

A company should not bid on a project simply because it seems attractive. Instead, it should first see how the project fits into the overall risk profile of the company's entire portfolio. Companies that take on large, complex projects but carry too much concentrated risk may run into financial problems.

This is particularly important today, with PPP markets concentrated in only a few countries, where debate about the PPP approach may be ongoing and where regulatory and legal structures may still be evolving. When deciding whether or not to take on PPPs in any given country, companies should examine the expected project pipeline of the country and sector, since setting up local teams and consortia, and conducting the initial legal and market due diligence, may incur large costs.

Consider developer funds, for example. These funds were established to free up cash from existing developments (by selling developed assets to the fund) and to provide financing for potential new developments. Pension funds and other institutional investors are attracted to developer funds because they consider infrastructure to be a long-term, low-risk investment that is hedged against inflation. Developer funds' investment policies, therefore, usually define clear risk guidelines that are in line with their investors' appetite for

risk. The rules may specify, for instance, the maximum percentage of investments that may be made in construction projects and favor lower-risk brownfield investments, or they may specify the maximum percentage of the portfolio that any new asset acquisition can account for. And since many pension funds prefer to limit their risk with government-backed revenue sources, such as availability-based pricing models, the policies may also limit the share of assets that do not have government backing. (In an availability-based model, the operator of a toll road would pay for the provision of the road with a specified service quality, independent of the number of users traveling on that road—an arrangement that eliminates demand risk and thus reduces default risk.) Developer funds may also target a specific country because it has a track record of successful PPPs and is fiscally strong. Or they may focus on certain sectors, such as hospitals, schools or roads, to build up expertise in those areas.

A project should fit well into the overall risk profile of a company's entire portfolio.

Engineering, procurement, and construction (EPC) companies can define their risk strategies similarly but with some modifications, such as including policies that specify the maximum level of exposure to a third-party contractor.

Manage Risk in the Bidding and Contract Negotiation Phases

Once it is clear that a project fits well in a company's overall portfolio, developers must drill down and address the key risks associated with that project. This process involves three steps: identifying the risks, quantifying the potential impact of those risks, and prioritizing them to highlight the ones that should be given the most attention. The top five to ten risks, in particular, should be detailed for management, and the company should develop steps for mitigating those risks.

Many risks, including environmental, site, design, and operations risks, can be addressed while the contract is being developed or while the regulatory framework is being established. Though some governments are inflexible when it comes to contracts and regulation, others are open to a dialogue with private-sector partners, either through pre-bid conversations or during the final contract negotiation, on how to make the partnership a real win-win.

Choosing the right partners can go a long way toward reducing a project's risk.

Private-sector companies might find it helpful to buttress their case with benchmarking information on PPPs from other countries. For example, in a central European country, electricity distribution companies conducted a detailed cost-benefit analysis and international benchmarking of the options for rolling out smart meters to residential customers. The companies shared the results with the government in a public review process and then, together with other stakeholders, agreed on a solution that helped guard the interests of both customers and private-sector investors. Customers were protected because the solution helped minimize the risk of rate hikes in the future. The private sector's investors were protected because the solution clearly specified the conditions for smart-meter installation and thus saved the companies from executing investments that would yield poor returns.

In some cases, these conversations can result in risk-sharing arrangements. Such arrangements may include provisions to share the positive or negative consequences of fluctuations in demand for the asset or the refinancing of loans tied to the project, setting pricing that is indexed for inflation, and developing mechanisms for compensating the private-sector company for higher commodity prices.

The details of these contract and regulatory features should then be analyzed to evaluate

what happens, under different scenarios, to the return that the private company earns. The analysis should include revenue-related factors, such as user price changes and ancillary revenues, as well as bottom-line and balance sheet factors, such as operating-expenditure cost changes or later-stage capital expenditure needs.

Finally, companies need to push back against government contracts that leave key details, such as the technical specification, unsettled or only vaguely defined. Companies need to spell out the unresolved issues and either clear them up before finalizing the contract or include contingency clauses that account for those uncertainties.

Select Partners That Can Fill Critical Needs

Companies should choose partners that fill gaps in the companies' own expertise. Selecting the right partners can go a long way toward reducing a project's overall risk, help deliver a project on time and within budget, and make sure that the specifics of the local market are properly accounted for in the plan. In most cases, local partners will include a local subcontractor that can deliver on public-sector goals, such as job creation. In India, for example, foreign road and airport concessionaires have teamed up with Indian construction firms in joint bids. Initial partnerships are usually nonexclusive and ad hoc, but they may evolve into more permanent and professionalized structures over time.

Control Construction Risk

Reports of high-profile infrastructure projects that have gone over budget or are facing major delays seem to surface daily. Construction presents major challenges, whether the project is an entirely new greenfield or an extension of an existing asset.

This is especially true in the increasing number of megaprojects, such as offshore oil and gas installations, next-generation nuclear power plants, and offshore wind farms. But it is also true for civil construction projects, such as the new Berlin Brandenburg airport, where problems with a complex, automatic

fire-safety system and its regulatory requirements have delayed the project by more than two years.

There is no easy way to prevent such problems. But companies that adopt the proven

best practices around all key aspects of large-project execution—from the initial design to commissioning—may be able to mitigate them. (See the sidebar “Driving Success in Large-Capex-Project Management.”)

DRIVING SUCCESS IN LARGE-CAPEX-PROJECT MANAGEMENT

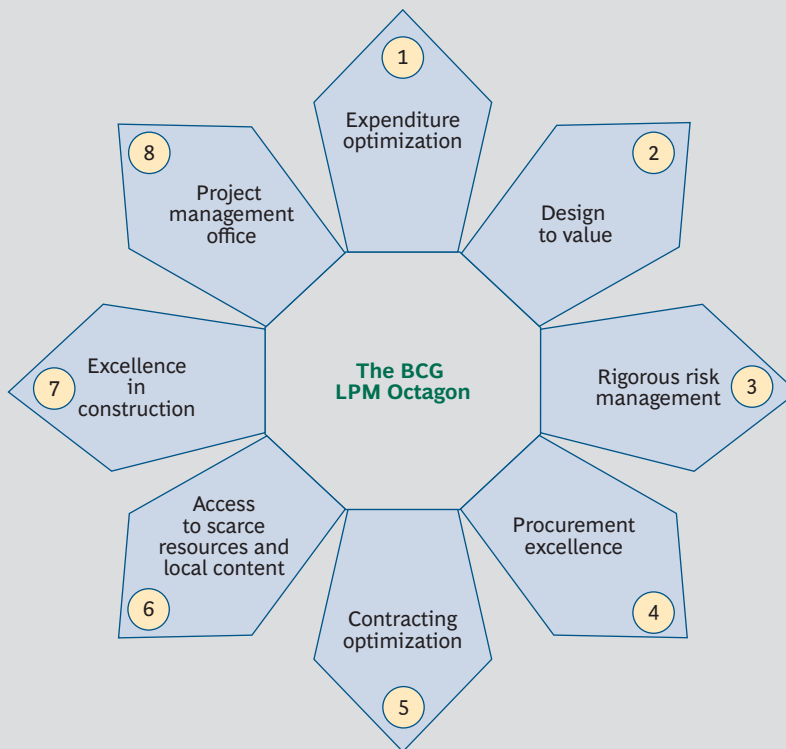
A myriad of potential landmines—from the complexity of a project itself, to swings in prices of commodities and other necessary materials, to getting access to key resources—lie in wait for project developers, owners, and contractors of large capital expenditure projects. Such challenges, however, can be overcome with the right planning. In our view, eight key action levers need to be addressed to ensure that projects are delivered on time and within budget.¹ (See the exhibit.)

- *Minimize capital expenditure requirements.* Creating a cost-focused culture is

critical. With a clear understanding of the drivers of cost, the needs and requirements of the end user, and industry best practices, managers can improve efficiencies and optimize project size to benefit from economies of scale.

- *Design to deliver value.* Contractors must understand the key drivers of value for their clients, such as minimizing upfront investment and long-term operating costs. With that in mind, engineering, procurement, and construction (EPC) companies and EPC

The BCG Large-Project-Management Octagon



Source: BCG analysis.

DRIVING SUCCESS IN LARGE-CAPEX-PROJECT MANAGEMENT

(continued)

management companies can tailor their plans to meet objectives at the lowest cost possible.

- *Apply vigorous risk management.* As projects grow larger and more complex, establishing a process for managing risk becomes imperative. This includes defining acceptable levels of risk and outlining plans for minimizing risk whenever possible.
- *Develop a program for efficient procurement.* Poor procurement practices can have a damaging ripple effect on a project, driving up budgets and creating costly delays. To optimize procurement functions, companies must embed a number of policies into their operations, such as bundling purchases and obtaining materials from low-cost sources around the world.
- *Optimize contracting strategy.* To develop a solid contracting strategy, companies should analyze a project's details and evaluate external market conditions, such as contracting trends among competitors. Developers should also have a disciplined process for selecting contractors, so that they can zero in on what truly differentiates the various bidders.

- *Secure scarce resources and local content.* Sometimes other ongoing projects in an area may compete for skilled labor and natural resources. Companies should determine the resources they will need and proactively plan for obtaining them in a tight market.
- *Ensure excellence in the construction phase.* Companies should develop highly efficient systems in manufacturing by adopting lean-process planning and working to eliminate defects. Their efforts should include breaking the construction plan into discrete pieces so that each can be designed to ensure speed and minimize bottlenecks.
- *Set up a project management office.* A dedicated project management office (PMO) can act as the central hub for a complex project, overseeing everything from human resources needs to troubleshooting. A well-functioning PMO can go a long way toward preventing delays and cost overruns.

NOTE

1. See *Eight Key Levers for Effective Large-Capex-Project Management: Introducing the BCG LPM Octagon*, BCG Focus, October 2012.

Manage Operations and Financial Risks

Once operational, a PPP must be run with the same rigor and discipline used to run any large business. This can entail hedging commodities exposure, for example, or creating a forward-looking strategic workforce plan.

Consider the workforce challenges that utilities in developed economies face. Because of a demographic shift in these countries, many utilities are facing a dearth of engineers and other skilled labor in the future, which could hamper the operation and the maintenance

of their power plants. As a result, several utilities have modeled in detail their exposure to demographic risks by breaking down their labor force into different skill categories and forecasting both the need and the anticipated supply of laborers in those categories. That analysis then becomes the basis for developing concrete measures, such as establishing new recruiting channels, that are designed to prevent skilled-labor shortages in the first place.

Private-sector companies must also manage the risk posed by adverse regulatory deci-

sions. Certainly many of those decisions are not within the control of private companies. But it is crucial to have ongoing, productive relationships with regulators to deal with technical, legal, and other issues as they arise. Most companies that are experienced in PPPs, therefore, have established senior regulatory-affairs departments that handle all regulatory negotiations, understand regulatory regimes and best practices in different locations, and coordinate much of the communication with regulators.

Engaging in community dialogue can build trust and strengthen public support.

Managing financial risks is also key. Most infrastructure assets require long-term financing, which is not always available at the right rates. Therefore, concessionaires need to actively manage and optimize their financial structures over the life cycles of their projects. This is particularly true for greenfield projects, where the project risk changes dramatically over time as construction risk is eliminated and actual demand is unveiled. This changing risk profile may require using different forms of financing over time to effectively mitigate refinancing risk and take advantage of lower credit spreads. For example, a project may initially be funded with bank debt and a private equity coinvestment but then switch to long-term bonds or a pension fund coinvestment for the remainder of the concession. Refinancing risks (and upsides) should ideally be shared with the public sector through the contract or regulation design.

Shape Public Perception

Infrastructure PPPs are more vulnerable to public backlash than any other type of business partnership. In fact, negative public opinion can completely derail an otherwise strong project. The reason: the risk of politicians intervening in a way that hurts the private sector rises exponentially when public perception of the project turns negative. This is especially true when the public begins to question whether profit motives will undermine safety or other public interests.

A key tool for ensuring against such a backlash is to build trust by engaging in community dialogue about the project early on. For example, the concessionaire in a PPP for water in Southeast Asia promoted public understanding and water conservation education by offering tours for schools and selling water to poor residents at reduced tariffs. Companies in other projects have used Internet communications, community information sessions, and public displays of project details. The specific approach that a company takes is less important than initiating a true two-way communication with the public to begin with. When people are invited to help shape a project's design and talk about any negative impacts, they are more likely to look favorably upon the endeavor. Celebrating key milestones with the community can strengthen public support as well.

Transparency, too, helps to build trust with the public. Companies should have a clear plan for addressing, monitoring, and reporting on key public concerns, such as environmental degradation or affordability issues for the poor. In some cases, companies may need to exceed the quality levels called for by the contract to convince the public that negative effects from the project are being minimized.

THE WAY FORWARD

EXPANDING POPULATIONS AND ECONOMIC growth in many parts of the world will continue to drive the need for significant infrastructure investments in the years ahead. But because most governments face limited budgets, satisfying that demand will require innovative thinking. Public-private partnerships can help meet the challenge by marrying the public sector's mission of infrastructure improvement with the private sector's ingenuity, financing ability, and operating discipline.

The history of PPPs, both successful and unsuccessful, across many projects and countries has created a broad knowledge base that companies can tap for future decisions. Applying the key lessons of those experiences will allow the public sector and the private sector to make PPPs a win-win proposition that helps drive true progress around the world.

FOR FURTHER READING

The Boston Consulting Group publishes many reports and articles that may be of interest to leaders in both the public sector and the private sector.

The New Landscape of Global Energy

An article by The Boston Consulting Group, December 2012

The 2012 European Railway Performance Index: Understanding What Drives High Performance

A Focus by The Boston Consulting Group, November 2012

Capital Procurement: The Cornerstone of Successful Projects

A Focus by The Boston Consulting Group, October 2012

Eight Key Levers for Effective Large-Capex-Project Management: Introducing the BCG LPM Octagon

A Focus by The Boston Consulting Group, October 2012

Built to Last: A Win-Win Approach to Regulating Public-Private Partnerships

An article by The Boston Consulting Group, September 2012

A Practical Guide to Change in the Public Sector

A Focus by The Boston Consulting Group, June 2012

The Coming Infrastructure Crisis: Is Your Supply Chain Ready?

A report by The Boston Consulting Group, February 2011

Toward a Distributed-Power World: Renewables and Smart Grids Will Reshape the Energy Sector

A report by The Boston Consulting Group, June 2010

Planes, Trains, and Automobiles: Crossing Paths in European Travel

BCG Opportunities for Action in Consumer, March 2009

NOTE TO THE READER

About the Authors

Marco Airoidi is a senior partner and managing director in the Milan office of The Boston Consulting Group. **Jeffrey Chua** is a partner and managing director in the firm's Singapore office. **Philipp Gerbert** is a senior partner and managing director, and **Jan Justus** is a principal; both are in BCG's Munich office. **Rafael Rilo** is a senior partner and managing director in the firm's Madrid office.

Acknowledgments

The authors would like to thank Christoph Rothballer for his critical contribution to this report. They also acknowledge the work and dedication of many members of BCG's Public Sector and Industrial Goods practices and Transportation, Travel, and Tourism sector. Finally, they thank members of BCG's writing, editorial, and production teams, including Katherine Andrews, Amy Barrett, Gary Callahan, Angela DiBattista, Lilith Fondulas, Abby Garland, and Sara Strassenreiter.

For Further Contact

For further information about this report, please contact one of the authors.

Marco Airoidi

Senior Partner and Managing Director
BCG Milan
+39 02 65 59 91
airoidi.marco@bcg.com

Jeffrey Chua

Partner and Managing Director
BCG Singapore
+65 6429 2500
chua.jeffrey@bcg.com

Philipp Gerbert

Senior Partner and Managing Director
BCG Munich
+49 89 23 17 40
gerbert.philipp@bcg.com

Jan Justus

Principal
BCG Munich
+49 89 23 17 40
justus.jan@bcg.com

Rafael Rilo

Senior Partner and Managing Director
BCG Madrid
+34 91 520 61 00
rilo.rafael@bcg.com

© The Boston Consulting Group, Inc. 2013. All rights reserved.

For information or permission to reprint, please contact BCG at:

E-mail: bcg-info@bcg.com

Fax: +1 617 850 3901, attention BCG/Permissions

Mail: BCG/Permissions

The Boston Consulting Group, Inc.

One Beacon Street

Boston, MA 02108

USA

To find the latest BCG content and register to receive e-alerts on this topic or others, please visit bcgperspectives.com.

Follow [bcg.perspectives](https://www.facebook.com/bcg.perspectives) on Facebook and Twitter.



BCG

THE BOSTON CONSULTING GROUP

Abu Dhabi
Amsterdam
Athens
Atlanta
Auckland
Bangkok
Barcelona
Beijing
Berlin
Bogotá
Boston
Brussels
Budapest
Buenos Aires
Canberra
Casablanca

Chennai
Chicago
Cologne
Copenhagen
Dallas
Detroit
Dubai
Düsseldorf
Frankfurt
Geneva
Hamburg
Helsinki
Hong Kong
Houston
Istanbul
Jakarta

Johannesburg
Kiev
Kuala Lumpur
Lisbon
London
Los Angeles
Madrid
Melbourne
Mexico City
Miami
Milan
Minneapolis
Monterrey
Montréal
Moscow
Mumbai

Munich
Nagoya
New Delhi
New Jersey
New York
Oslo
Paris
Perth
Philadelphia
Prague
Rio de Janeiro
Rome
San Francisco
Santiago
São Paulo
Seattle

Seoul
Shanghai
Singapore
Stockholm
Stuttgart
Sydney
Taipei
Tel Aviv
Tokyo
Toronto
Vienna
Warsaw
Washington
Zurich