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Partnering for value
Structuring effective public-private partnerships for infrastructure

A Deloitte Research study

Contents

Introduction

After decades of neglect, and despite many other distractions in the global economy, infrastructure has finally made it to the top of the political agenda. According to a recent survey, 77 percent of senior business executives believe that the current level of public infrastructure is inadequate to support their companies' long-term growth. These executives believe that over the next five years, infrastructure will become a more important factor in determining where they locate their operations.[1]

The public also has awakened to the consequences of neglecting our roads, bridges, public transit, electricity grid and other social infrastructure (such as hospitals and schools). According to a recent poll, 94 percent of Americans are concerned about the condition of the nation's infrastructure. Remarkably, 81 percent said they are willing to pay 1 percent more on their federal income tax to improve America's infrastructure.[2]

Table 1. 2009 global stimulus programs with a significant infrastructure component

Country	Spending on infrastructure
Australia	Around AUD 28 billion[a]
Canada	CAD 12 billion[b]
China	Around USD 438 billion[c]
European Union	Around EUR 173 billion[d]
France	Upward of EUR 10.5 billion[e]
Germany	Around EUR 19 billion[f]
Japan	Around JPY 2.6 trillion[g]
India	Around USD 33.5 billion[h]
Sweden	SEK 1 billion[i]
United Kingdom	GBP 3 billion (in capital spending brought forward)[j]
United States	Around USD 113 billion[k]

[a] Gemma Daley, "Australian Senate Passes Rudd's A$42 Billion Stimulus," *Bloomberg News*, February 13, 2009 <http://www.bloomberg.com/apps/news?pid=20601110&sid=apqK4QGQTUSY>.
[b] "$12B for Infrastructure Forms Key Pillar of Stimulus Package," *CBC News*, January 27, 2009 <http://www.cbc.ca/canada/story/2009/01/27/budget2009-infrastructure.html>.
[c] Bill Powell, "Should China and the U.S. Swap Stimulus Packages?," *Time*, March 05, 2009 <http://www.time.com/time/business/article/0,8599,1883277,00.html>.
[d] International Federation of Consulting Engineers, "Fiscal Stimulus Package Survey 2009" <http://www1.fidic.org/about/infra09/>.
[e] "Sarkozy Outlines €26 billion French Stimulus Plan," *New York Times*, November 4, 2008 <http://www.nytimes.com/2008/12/04/business/worldbusiness/04iht-04franc.18398529.html>.
[f] Daniel Schmachtenberg, "German Infrastructure Stimulus Packages: Necessity Is the Mother of Invention," January 2009 <www.ashursts.com/doc.aspx?id_Content=4161>.
[g] "Japan Unveils New Economic Stimulus of 15.4 Trln Yen," *Reuters*, April 10, 2009 <http://www.reuters.com/article/usDollarRpt/idUST26081720090410>.
[h] International Federation of Consulting Engineers, "Fiscal Stimulus Package Survey 2009."
[i] "Worldwide Inventory of Infrastructure Spending Plans," Foreign Affairs and International Trade Canada, January 21, 2009 <http://www.international.gc.ca/canadexport/articles/90121h.aspx>.
[j] Ibid.
[k] "Infrastructure and the American Recovery and Reinvestment Act of 2009," Deloitte, March 12, 2009.

Thanks to the stimulus packages unveiled in many countries during 2009 (see table 1), public infrastructure is receiving both long overdue attention and a significant infusion of public funds. While these are welcome developments, the level of direct government funding proposed will meet only a tiny fraction of infrastructure needs around the world. In the United States, according to the American Society of Civil Engineers, there is a $2.2 trillion gap between the supply of and demand for roads and bridges, water and sewage systems, public transit systems and other public infrastructure (see appendix A).[3] The infrastructure stimulus money from the 2009 American Recovery and Reinvestment Act (ARRA) addresses less than 5 percent of these infrastructure needs.

That said, the current confluence of events does present government leaders with a once-in-a-lifetime opportunity to make a timely and economically productive down-payment on closing the global infrastructure gap.

Funding is not the only challenge. A business-as-usual approach by the public sector will waste an important opportunity to make our infrastructure safer, more efficient and more effective. The inadequate, and in some cases dangerous, state of certain infrastructure demands new thinking to speed its improvement. This means using the full complement of innovative infrastructure financing and delivery solutions that are available, while also developing new approaches to address today's challenging credit markets.

To be sure, the landscape for public and private infrastructure financing has changed dramatically since the financial crisis began in 2008. Just as governments are strapped for cash, some private firms have and may continue to face difficulty raising capital in constricted financial markets. This does not mean, however, that private involvement is now off the table. Among other things, this study explores how governments can make limited public dollars go further by leveraging the $180 billion in private equity that has reportedly been raised by infrastructure funds over the past few years (which could theoretically translate to over $300 billion of incremental leveraged purchasing power).[4]

To effectively capitalize on this rare window of opportunity, governments need to look beyond the short-term influx of stimulus dollars and articulate a much broader vision for enhancing infrastructure as measured not just by jobs, but by enhanced productive capacity for the future. The purpose of this study is to help government leaders address the longer-term issues associated with pursuing their infrastructure objectives in today's environment. Specifically, this study will help government leaders answer the following question: *How can the optimal mix of public and private sector involvement for any given project be determined so that limited public dollars can create maximum public value?*

The need for innovation in infrastructure partnerships

"We need to have an open mind about this. We need to think outside of the box."

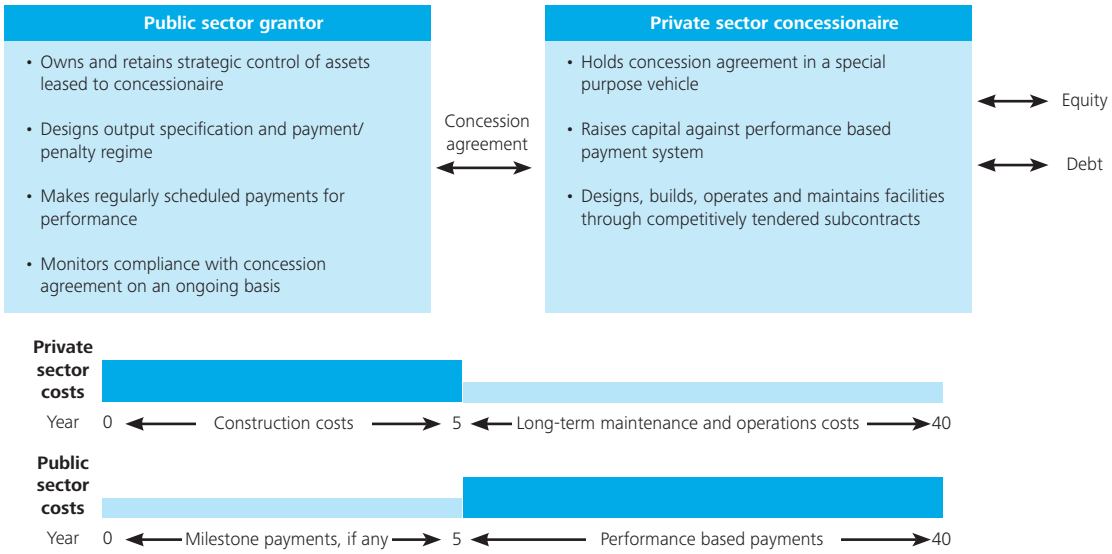
– U.S. Department of Transportation Secretary Ray LaHood.[5]

With a greater number of priorities (and industries) competing for public funds in the wake of the credit crisis, governments are under more pressure than ever before to be creative about how infrastructure needs are met. If infrastructure gaps are to be narrowed, the traditional models of financing and delivering infrastructure must give way to new, innovative models and a portfolio of hybrid approaches. The structure and financing of infrastructure projects involving both the public and private sectors (public-private partnerships, PPPs or P3s) will need to evolve in response to changing conditions in the financial markets. In countries around the world, we are starting to see the outlines of what such innovations may entail.

- In early 2009, the Florida Department of Transportation entered into a $1.8 billion 35-year concession with a private consortium, headed by the Spanish firm ACS Infrastructure Development, to build and operate high-occupancy toll lanes near Fort Lauderdale. The financing includes more than $200 million in equity, $750 million in commercial bank debt and a $603 million loan from the federal Transportation Infrastructure Finance and Innovation Act (TIFIA) program.[6] In this PPP, the Florida DOT will set toll rates, retain all revenues and make "availability payments" to the private concessionaire annually out of all of its revenues (including state appropriations, tax revenues and tolls). The project is the first U.S. toll road PPP structured with performance-based availability payments (see figure 1).

- The United Kingdom is in the midst of the nation's largest-ever school buildings investment program, with a goal of rebuilding or renewing nearly every secondary school in England. To realize this ambitious goal, the central government has created a PPP model called a Local Education Partnership (LEP), a private

Figure 1. The "availability payment" model



Source: Deloitte

sector consortium working in formal partnership with local authorities and the central government. Certain LEP projects are being delivered through conventional capital funding and design-build contracts, while others employ PPP models. The program is designed to capture economies of scale in delivery by bundling multiple facilities into a single procurement.

- Other innovative structures emerging around the world include the combining of multiple public authorities (such as neighboring local government entities) to procure a single project or service. The four local authorities covering the city of Dublin, for example, were keen to move away from their traditional reliance on landfills and together procured a large-scale waste-to-energy facility to meet the needs of all four authorities. The improved project economics attracted a broader array of bidders to the procurement, resulting in cost efficiencies for the local authorities. An agreement to purchase the generated power at a reduced cost is an added benefit to the authorities.

The five components of an infrastructure project

Design. Under virtually any partnership structure the responsibility for design will be shared. For instance, even in partnership structures with high degrees of private responsibility, the public sector's articulation of performance specifications will limit the range of design options. In many projects, the need to ensure compliance with broader planning and environmental guidelines results in a significant degree of public sector design.

Construction. This component includes the construction of the physical asset(s) over a prescribed period of time, generally at a prescribed cost. Deciding which party assumes the impact of construction cost overruns and time delays must be considered.

Service operation. Operating the asset may include various activities from general management of service provision and revenue collection to performing soft (or non-core) services associated with an asset, such as laundry services within a hospital. Operation typically begins at the end of construction, upon agreement that the construction has been satisfactory. In PPPs, the private partner's compensation is dependent on the achievement of performance standards.

Ongoing maintenance. Generally, there are two principal types of maintenance to be considered in any infrastructure project: ongoing regular maintenance (or operating maintenance), and major refurbishment, often called life-cycle or capital maintenance.

Finance. This component generally includes financing for the capital costs of construction, as well as working capital requirements.

These projects, each with its own distinct mix of public and private participation, demonstrate the diversity of delivery models available today. There is no longer a binary decision between public and private. In reality, nearly every public infrastructure project involves a large degree of private sector participation through the normal channels of a market economy. Most PPP models simply represent a way of deepening and/or broadening the private sector's engagement in delivery in exchange for sharing in the associated risks and rewards.

The question policymakers in the United States, the United Kingdom and Ireland had to answer in the above examples was not whether to involve the private sector in infrastructure projects, but rather:

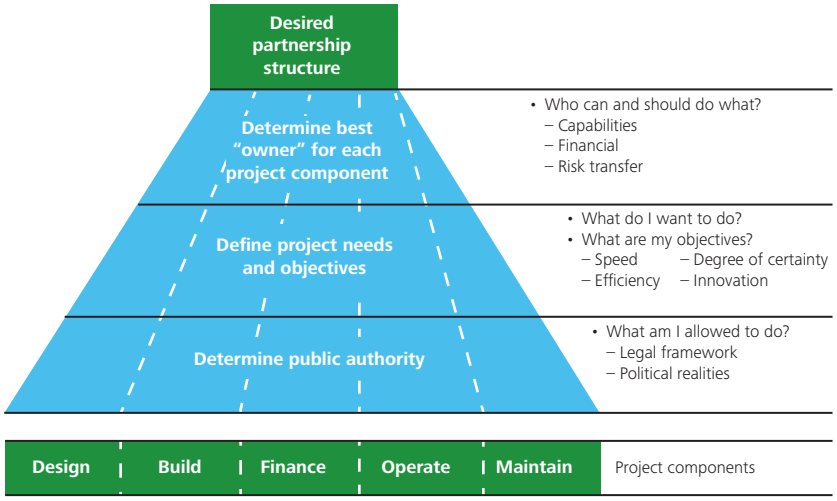
> *What is the optimal mixture of public and private sector participation in the project to maximize public value?*

This is the central question facing infrastructure policymakers today. And there's no one-size-fits-all answer for every situation.

Most infrastructure projects are composed of five elements for which responsibility must be assigned: design, construction, service operation, ongoing maintenance and finance (see nearby box). Theoretically, any of these elements and their related risks can be allocated to either the public sector or the private sector. The shape of that allocation determines the structure of the partnership.

Dividing up these responsibilities in the best possible way for any given project is not easy. It requires careful qualitative and quantitative analysis. Short-cutting this process could result in suboptimal allocation and lost value. How then can public sector entities decide which project responsibilities they are best suited to retain, and which they are better off shifting to the private sector? The decision making process is depicted in the schematic (see figure 2).

Figure 2. Determining the right mix of public and private involvement in infrastructure financing and delivery



Source: Deloitte Research

Step 1: Determine public authority

What am I allowed to do?

What laws and policies exist regarding the delivery of infrastructure and the potential involvement of private finance? Are there political, legal or policy constraints that would make it difficult to use certain partnership structures?

These questions are among the first that need to be answered before a public sector entity gets too far ahead of itself. The legal and policy framework in place — in addition to the temperament of the electorate — will automatically narrow the pool of possible partnership options. Most public sector entities face restricted choice in partnership arrangements. For example, U.S. state legislation in this area runs the gamut, from prohibiting even design-build contracts to permitting fully fledged concession arrangements.

Of those governments with laws on the books, some are finding that the enabling legislation does not provide the flexibility necessary to support the range of possible deals in which political leaders are interested. The presence of a legal structure that is more or less in line with market norms for PPP-type projects in more mature markets will be of assistance. With governments worldwide competing to attract private investment, a poor legal framework will stymie a jurisdiction's efforts to increase the degree of private sector participation in infrastructure development.

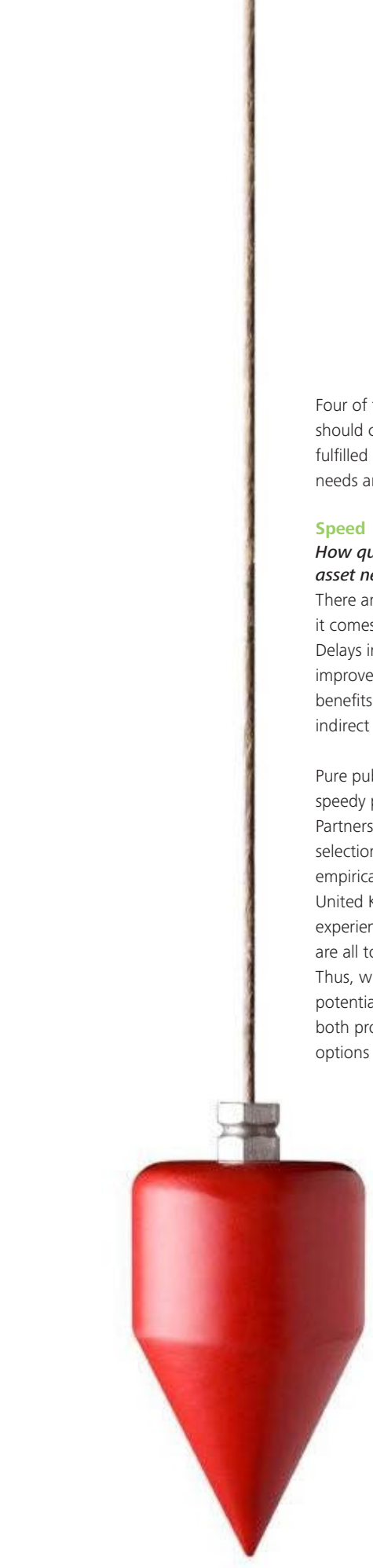
Recently, several governments have improved upon their existing legislation. The State of California has adopted a new legal framework for transportation PPPs that authorizes regional transportation agencies and Caltrans to enter into an unlimited number of PPPs through 2017, removing earlier restrictions on the number and type of projects they may undertake. The legislation establishes an independent Public Infrastructure Advisory Commission to advise state and local agencies on PPP best practices, and it allows for solicited and unsolicited proposals from the private sector.

In addition to legislative constraints, political factors often determine the extent or nature of private sector involvement. For instance, the Commonwealth of Pennsylvania was unable to garner sufficient legislative support to enter into a concession agreement for the Pennsylvania Turnpike that would have raised $12.8 billion to meet other pressing transportation needs. In Canada and elsewhere, "core" services (such as teaching, health care and prison guards) are distinguished from "non-core" services (such as janitorial services, food services and transportation), and the public sector generally retains the former.

Step 2: Define project needs and objectives

What do you want to do?

Once a public sector entity has determined what it is permitted to do, the next step is to define the project goals. First, define the need. For instance, it could be "congestion in a certain corridor must be reduced by 15 percent over the next three years." The next step is to define the service solution and associated assets to meet that need. In this case, the solution might be to deliver a new toll road with specific capacity within a specified time period. Lastly, policy makers must determine how the solution will be delivered and funded. Can tolls or congestion charges be introduced, or must public funds from general (or special) taxation be made available?



Four of the most common variables that governments should consider when defining the need that must be fulfilled are speed, efficiency, degree of certainty about needs and innovation.

Speed

How quickly does the asset or improvement to the asset need to be delivered?

There are two important dimensions to speed when it comes to infrastructure: procurement and delivery. Delays in either mean that the public waits for needed improvements or added capacity, and that the expected benefits from the project are delayed, adding to the indirect costs of the project.

Pure public approaches can often be characterized as speedy procurement followed by lengthy execution. Partnership approaches with reliance on value-based selection can often be characterized as the reverse. While empirical data in this area are limited, studies from the United Kingdom and Australia suggest that PPPs rarely experience the types of significant time overruns that are all too common in public infrastructure delivery.[7] Thus, when evaluating the speed of delivery, the total potential time period should include a realistic view of both procurement and construction periods for all of the options being considered.

There are several factors to take into account at the outset of a project that can substantially compress delivery time, starting with the procurement approach. Can the project be designed in-house? If the answer is no, and the public sector must look to a private contractor to do the majority of the design work, then it may be useful to link the design and build components of a project, thereby reducing the overall procurement time line. Doing so avoids the need to run sequential procurement processes for design and construction.

Another consideration in gauging the potential speed of delivery is funding/finance. In some circumstances, particularly those in which public funding is available only on a pay-as-you-go basis, partnership approaches can accelerate delivery of infrastructure improvements simply by creating the possibility of financing.

Efficiency

How can the asset be delivered and maintained as efficiently and cost-effectively as possible?

This concept of bundling certain project components to shorten procurement time lines can be further extended to reduce the overall cost of ownership for a new asset. Traditional procurement models tend to reward the lowest cost bidder, thereby devaluing quality and innovation on the part of contractors. In addition, such models can incentivize "change orders" that increase the cost and delay the delivery of projects.

Properly structured partnerships, on the other hand, bundle elements of the design, build and maintenance components of a project and focus the contractor's attention on delivering the lowest overall life-cycle cost. The result is a better product up front, delivered more efficiently and more systematic maintenance of assets (that meet specified performance standards) — something that most governments, faced with efficiently allocating limited resources, have found challenging.

Using Innovative Financing and Delivery for School Modernization

Built in the 1920s, James F. Oyster Bilingual Elementary School was on its last legs by the early 1990s. The school's strong academic record stood in contrast to a structural crisis—leaking roofs, building code violations and accompanying shutdowns, lack of computer hookups and limited space. Yet the District of Columbia didn't have the $11 million required to build a new school, nor did it have the borrowing power. The District had to make a hard decision: shut down the decrepit building and relocate students, or find another way to bring the school up to code.

What the District lacked in financial assets, it made up for in physical assets: the school sat on 1.67 acres of prime real estate within walking distance of the National Zoo. The District converted its underused physical assets into a financial asset by dividing the property, half for a new school and half for a new apartment building—both designed and built by the private sector. In exchange for giving the private sector partner the development, operation and maintenance rights for the new apartment building, the District got its first new school in 20 years—a state-of-the-art facility with double the space. The bond issue that financed construction is backed by the incremental revenue generated by the project, which consists of the taxes and other payments by the private partner generated from the operation of the apartment building.

In 1996 the Houston Independent School District used a lease-leaseback arrangement with a private developer to obtain two new schools for $20 million less than the budget and a year earlier than originally planned. Besides solving the financial problem, potential benefits of increased private sector participation in school modernization include faster construction, innovative design and more time for school administrators to focus on core educational goals rather than facilities management.

In 2006 the Rensselaer, NY, school district, lacking sufficient public borrowing capacity, executed an innovative "land swap" transaction to build a new school to replace its old, overcrowded facilities. The old school sat on prime waterfront property, and a private developer held land in another location that was not as desirable for residential or commercial purposes but was appropriate for the school. Through a financing vehicle that raised tax-exempt debt secured by lease payments, the parcels were swapped, and the new school was constructed by the developer who in turn received development rights on the waterfront parcel. In addition to a new, modern and larger school, the city of Rensselaer will also have a redeveloped commercial and residential section on its highly desirable waterfront, further contributing to its economic recovery. Essentially a design-build PPP, this project demonstrates how innovative thinking between the public and private sector can meet multiple goals of both parties and create "win-win" situations.

These examples point to an important and growing strategy for meeting school infrastructure needs: innovative partnerships with the private sector. PPPs can be structured in a number of ways to meet school modernization objectives. Private firms typically finance, design, construct, and operate a public school under a contract with the government for a given time period, usually 20 to 30 years. Businesses usually provide non-core services such as school transport, food services and cleaning, while the government assumes responsibility for teaching. Common PPP models can include the sale of development rights on unused property, and sale-leaseback or lease-leaseback arrangements. In these solutions, school districts can sell or lease surplus land to a developer who then builds a school and leases it back to the school district.[8]

Source: William D. Eggers and Tiffany Dovey, "Rebuilding America's Schools" *Education Week*, January 24, 2008.

Degree of Certainty

Will changes in technology, policy or demand affect how the needs of tomorrow are met?

In many situations, the public sector must maintain a degree of flexibility to meet likely, or even unanticipated, evolution in infrastructure and service needs. Some partnership models are ill-suited to infrastructure systems that are likely to be recast over time to meet changing demand, particularly growth. If the public sector is not certain about the performance requirements underlying the partnership, then it will be difficult to achieve a fair contract price and to ensure that the infrastructure will continue to meet future demands.

Uncertainties might result from latent defects (flaws in the existing infrastructure that are not apparent until work begins), policy changes (implying a change in service requirements), demand risks (resulting from the introduction of user choice, for example), changes in public needs or rapid changes in technology. For projects that are especially vulnerable to these uncertainties, partnership models with increased flexibility and shorter contract periods can improve the likelihood of achieving infrastructure objectives.

How infrastructure needs are defined and met will change with advances in technology. New technology can make the unexpected and, at times, the seemingly impossible, possible. One example is the tunnel constructed to add the missing link to the A86 ring road around Greater Paris. A problem that had perplexed urban planners for more than 30 years was resolved thanks to rapid advances in technology, such as made-to-measure tunnel boring machines that could simultaneously drill, excavate and provide structural finishing.

Innovation

Is there an opportunity to incorporate private sector innovation?

Is there scope for innovation in either the design of the solution or the provision of services? Does some degree of flexibility remain in the technical solution/service or the scope of the project? The partnership that created the CityLink private tollway in Melbourne, Australia, for example, introduced a number of customer-friendly innovations to make paying tolls a more positive experience. CityLink delivers alerts to customers' mobile devices when their accounts run low, and it makes house calls to install toll tags on customers' vehicles. An independent body, the CityLink Ombudsman, resolves disputes, and the organization provides transparency and accountability via customer charters and scorecards. Hence, the level of innovation and flexibility desired may affect the method of procurement selected.

Step 3: Determine the best "owner" for each project component

Who can and should do what?

Determining what you have authority to do and then what you want to do will begin to narrow the options for structuring the relationship with the private sector. The next step is sorting out who can and should do what. The sorting process has three principal components: capabilities, finance and risk.

Capabilities

What capabilities do we have in house to deliver and/or manage the project?

In what areas of project delivery does the public sector project sponsor excel: design, operations, maintenance, financing? What capabilities are present in the market? For example, if a government excels at road maintenance but is weak on construction (cost or timing), it might decide to bear responsibility for long-term asset condition, but allow a private partner to add value at the front end of the project.

The same goes for management. Large capital projects are complex and require a great deal of experience to manage successfully. Partnerships add another layer of complexity, and institutional capacity building must be a core element of any PPP program. Effective project management is essential to limit risk and cost overruns and streamline delivery, so the presence of competent staff is of particular importance when funding is tight. The need for strong project management may necessitate training or shifts in internal staff. It may also mean that certain projects are not worthy of pursuit in light of the associated risks.

Financial

How are we going to pay for the infrastructure?

An important, but often confused, distinction to draw when considering the financial elements of an infrastructure project is that between funding and financing. The funding for a project is its long-term source of support. In the case of public infrastructure, this may be revenues generated by the project, dedicated tax revenues or general resources of the sponsoring public sector entity. The financing of a project is the means by which the funding is leveraged to provide enough up-front cash to purchase, construct or adapt the project. It is important to note that, while there may be many creative financing vehicles available, once the funding structure is established, all of these financing vehicles will be "securitizing" the same project economics.

Historically, U.S. public sector entities have supported infrastructure development through pay-as-you-go cash funding or debt financing through a myriad of credit structures and instruments. Given already overstretched budgets, dismal fiscal outlooks for the near to medium term, and a general reluctance to raise taxes and impose new fees in the current economic climate, most public sector entities will be challenged to fund a slate of new projects to rehabilitate existing assets and enhance current capacity on a pay-as-you-go basis. Likewise, borrowing capacity for many public sector entities is constrained, and credit positions have been weakened by fiscal stress, making access to credit-sensitive financial markets more difficult.

In this atmosphere, partnership structures may prove appealing for many public sector entities. They may consider partnership structures that reduce the public sector's capital payments over the lifetime of the asset (or contract), monetize existing assets to pay for new ones or allow for financing by the private sector that does not eat into public debt capacity. Using PPPs to raise private capital for public projects can help to spur job creation when projects would otherwise be put on hold. This, in turn, can enhance public sector revenues through associated tax revenue.

Risk Transfer

How much risk should be transferred?

Answering this question correctly and allocating risks accordingly maximizes public value. There are several risk allocation conventions (for example, a private contractor is naturally positioned to efficiently manage construction risks, a government is better positioned to control and absorb regulatory risk), but every partnership is unique and carefully negotiated. Beyond the conventional wisdom of placing the various risks with the party best able to manage them lies the reality of competing public policy goals, the finite risk capacity of the marketplace and the difficulty of holding a risk allocation fixed throughout a negotiation. In short, risk allocation is the search for optimality.

As partnership models proliferate around the world, risk allocation principles are becoming increasingly sophisticated and the parties are becoming more adept at crafting structural solutions to risk capacity constraints. For example, many PPPs have been structured to isolate discrete and identifiable "chunks" of risk (such as tunneling) to avoid contaminating the overall risk-sharing approach with inefficient pricing. The public sector has discovered efficient ways to "write down" those elements and still achieve value. The key is to optimize, rather than maximize, the level of risk transfer.

One of the core tools being used in international P3 that is now gaining ground in the United States is Public Sector Comparator/Value for Money analysis. The term Public Sector Comparator (PSC) refers to the risk-adjusted whole-of-life cost of procuring an asset or service through whatever is considered the conventional public procurement method. The term Value for Money (VFM) refers to the result of a comparison between the PSC and the risk-adjusted whole-of-life cost of procuring the same asset or service from a private party.

The PSC/VFM analysis is used to describe the difference in risk-adjusted cost to the public sector between conventional procurement and PPP procurement. In a direct comparison, whichever model produces a lower cost is said to provide Value for Money (see appendix B for a schematic of the analytical process). The practice in many countries is to perform this analysis as part of the approval process for undertaking a project as a PPP. In those cases, unless VFM can be proven, the project is either aborted or pursued by conventional procurement means.

A key first step in developing a PSC/VFM framework is to define "conventional" public procurement. For U.S. public sector entities, that is likely to be a marrying of the best-practice contracting method (design-bid-build or design-build) with some form of bond financing. In countries where this analysis has been widely practiced, the sovereign cost of capital is used as the benchmark. That concept is irrelevant for the United States, where infrastructure is conventionally financed in the tax-exempt long-term debt capital markets.

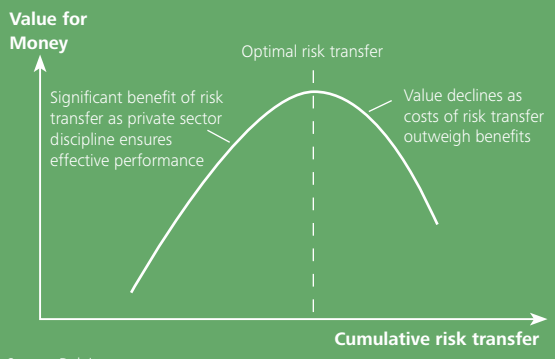
Accurately assessing the value created by partnership structures in today's turbulent financial markets requires complete transparency in both the public and private sectors' costs. An accurate assessment also requires realistic assumptions about whether a project could actually proceed through traditional means if Value for Money is not demonstrated using PPP. With public funds less available and being used to finance an expanded number and degree of activities (social welfare needs, economic stimulus spending and financial system recovery), the validity of this assumption should be confirmed. If the project would not proceed unless a PPP is used to deliver it, then the benefits of expedited delivery should be factored into the analysis.

Common risk allocation mistakes

Several common mistakes can occur when governments set the risk terms of a partnership structure.

1. Goldilocks syndrome. There can be a tendency in partnership structures to transfer either too much or too little risk. Because the public sector can be risk averse, with public sponsors often looking to PPPs to save up-front or total project costs, there are times when too much risk is transferred to the private sector. The result is a project that is difficult to finance, which in turn reduces the quality of partners willing to bid on it and ultimately increases costs of delivery. While the public sector must be vigilant in protecting its own interests, the point of risk transfer that will cause private partners to walk away from a deal can often be difficult to predict. Consequently, the public sector should be cognizant of the private sector's risk capacity constraints when structuring the initial bid documents, and be open to further negotiations on some items when the preferred bidder is selected. Optimal risk transfer ensures that there are enough high-quality bidders to reap the benefits of robust competition and that the public sector does not "overpay" to transfer risk that it is better suited to retain (see figure 3).

Figure 3. Optimizing risk transfer to maximize Value for Money



Source: Deloitte.

2. The Beetle vs. the Ferrari. The public sector often views partnering as a way to achieve higher service levels from the private sector. Private partners are more than willing to provide high-quality service levels, but they expect to be paid for doing so. The public sector cannot expect to get a Ferrari for the price of a Beetle. Understanding this at the outset will help to establish more realistic performance standards in the project agreement and mitigate sticker shock once the bids come in. PSC/VFM analysis seeks to create an apples-to-apples comparison that enables the public sector sponsor to make a best value choice. Once the project agreement is signed, the public sector is aware of the quality of service that will be provided for the term of the contract. This approach contrasts with conventional procurement models, where the quality of service has been shown to decrease over the length of the contract as maintenance requirements become more costly.

3. Buy or Lease? Leasing a car might cost you less per month than making payments on a car you buy. But when the lease is up, if you want to purchase the car, there's a balance to pay. Depending on the car's features or service level, on top of anything else that may have changed since the lease was initially signed, the amount owed might be higher than the current value of the car. Consequently, before deciding whether to buy or lease, it is important to carefully evaluate what your needs are at the outset, and how advances in technology may affect those needs over time. The same is true of entering into partnership agreements. Making a realistic determination of actual needs up front, assessing how those needs may change over time and identifying the acceptable levels of risk associated with each of those needs are important steps in preventing surprises down the road.

4. Optimism Bias. Several studies have found that during infrastructure procurements, public sector entities tend to be overly optimistic about a project's costs and time lines and about its potential to generate revenue. Separately, bidders' optimism is particularly pronounced when it comes to forecasting demand for a product or service, given the desire to provide the best bid possible. Governments use several approaches to mitigate demand optimism bias. These include setting a range of revenue returns in the contract terms; allowing for a renegotiation of the contract if the returns are below the set range and limiting the private partner's profits if returns are above the desired range; providing financial payments to the private partner if demand is below a certain level; and setting the duration of the total project concession to a targeted revenue amount (that is, once the private partner has hit the specified revenue ceiling, the concession ends).

Optimal partnership structure

Completing these three steps—determining public authority, defining project needs and objectives, and determining the best "owner" for each project component—should yield the optimal partnership structure for any given infrastructure project (see table 2 for an integrated guide to the steps). To see how this might work in practice, appendix C lays out how this approach is applied to the case of a hypothetical wastewater treatment plant.

Table 2. Integrated map for infrastructure modernization

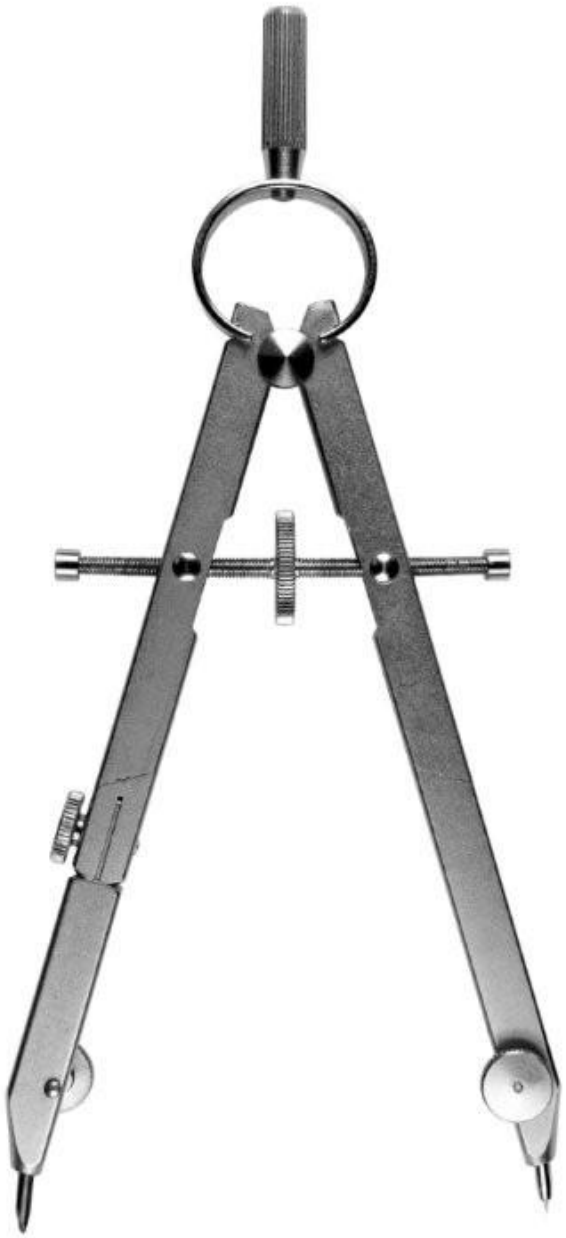
Step	Considerations	Key questions to ask	Impact on private involvement
Determine public authority (What do I have permission to do?)	Laws and statutes	What laws and policies exist regarding private financing and delivery of infrastructure?	A poor legislative and statutory environment will constrain efforts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

Conclusion

In these challenging times, governments are coping with the normal course of fiscal stress overlaid with a new set of extraordinary demands on their resources. At the same time, it is clear that reverting to a default setting of earlier times — putting infrastructure investment on hold until the economy has recovered — will put economies in an ever more precarious position going forward. If infrastructure gaps are to be narrowed, the public sector must respond with creative and flexible solutions that evolve with the changing environment. The old models of financing and delivering infrastructure must give way to new, innovative models and a portfolio of hybrid approaches.

Too often, public sector entities are unaware of the alternatives available to them or of the considerations involved in selecting the most appropriate delivery models for their capital projects. This has resulted in less-than-ideal outcomes from traditional procurements and public-private partnerships alike. By applying a bottom-up approach to the development of a partnership structure, the public sector can deliver projects in a way that most closely approximates the optimal solution within the confines of what is possible.

Careful, informed analysis at the outset of a project will help to ensure that limited resources are put to their best possible use, while putting government organizations in the best position to achieve their infrastructure objectives in today's challenging climate. Used systematically, such a disciplined approach to project structuring will also put the public sector on a strong footing for continued innovation beyond the current crisis.



Appendix A: Estimated U.S. infrastructure deficit

Defined comprehensively	Huge legacy needs ($Billions)
Transportation (roads, bridges, transit and rail)	1,300+[a]
Education facilities	322+[b]
Energy transmission	1,500+[c]
Criminal justice facilities	12.5+[d]
Technology architecture	100+[e]
Water systems (drinking water, wastewater, levees, inland waterways and dams)	585+[f]

[a] American Society of Civil Engineers: $1.3 trillion for roads, bridges, transit and rail over 5 years.
[b] National Education Association: one-time investment.
[c] American Association of Civil Engineers and the Brattle Group: for 2010-2030.
[d] Pew Center for the States: for 2007–2011.
[e] EDUCAUSE: $25 billion annually over four years.
[f] American Association of Civil Engineers and Association of State Dam Safety Officials: $110 billion over 10 years for drinking water; $275 billion one-time investment for levees, inland waterways, and dams; $390 billion over 20 years for wastewater.

Appendix B: Applying the Value for Money test

Irrespective of the procurement structure used, any public sector authority should have a methodology to demonstrate that Value for Money (VFM) has been achieved. It is clear that this is not always easy to do, however. Across the world, methodologies for assessing whether PPP deals offer VFM have been developed and used with some success. Overall, VFM testing considers whether the procurement structure being considered offers a lower overall cost (in present value terms) relative to an estimate of the risk-adjusted costs were the public sector to deliver the project itself (commonly referred to as the Public Sector Comparator, or PSC).

Developing the Public Sector Comparator

The PSC incorporates an assessment of all project costs, revenues and risks projected for the project. The PSC developed should be used as a VFM assessment tool throughout the procurement process and as a management tool for considering options during bidder negotiations and consultation. The PSC should therefore be developed using realistic costings for a realistic alternative to the PPP model being considered.

Costs for inclusion in PSC

A detailed evaluation of project costs and revenues is required (see nearby box). It is important that those costs are considered, based on the same scope of services being requested within the PPP structure. The PSC should also consider all costs relating to the project, including costs that will not be transferred to the private sector under any structure.

Cost/revenue headings

- Capital/construction costs
  - Construction period
  - Life-cycle costs (operations period)
- Operating costs
  - Core services
  - Non-core services
  - Maintenance
  - Insurance
- Taxation
- Third-party income (based on public sector ability to generate)

Cost and revenue should be estimated based on precedent (construction and operating) methodologies used by the public sector on similar projects. It is important that cost estimates not be overly optimistic to avoid creating an unfair comparison. The key question for the public sector when costs are being finalized is whether the project could realistically be delivered within the budget proposed if required. If this is not the case, then the budget should be adjusted to a more appropriate level.

Risk assessment

The PSC must consider the project as if the public sector were to deliver it using the same scope, service levels, time lines and build quality required of the private sector. The PPP procurement structure will require a fixed price deal delivered within a defined period with various operating risks being retained by the private sector. The PSC must therefore include an assessment of the cost of these risks to the public sector, for example, cost overruns or time delays based on previous public sector experience.

While difficult to do, the PSC will involve the development of a risk register that identifies all of the project risks involved. Ideally, each risk for each element of the project over the entire life of the project should be identified. In turn, each of these individual risks should be considered, valued and designated for transfer to the private sector under the PPP structure or for retention by the public sector. Either way, they should be included in the PSC.

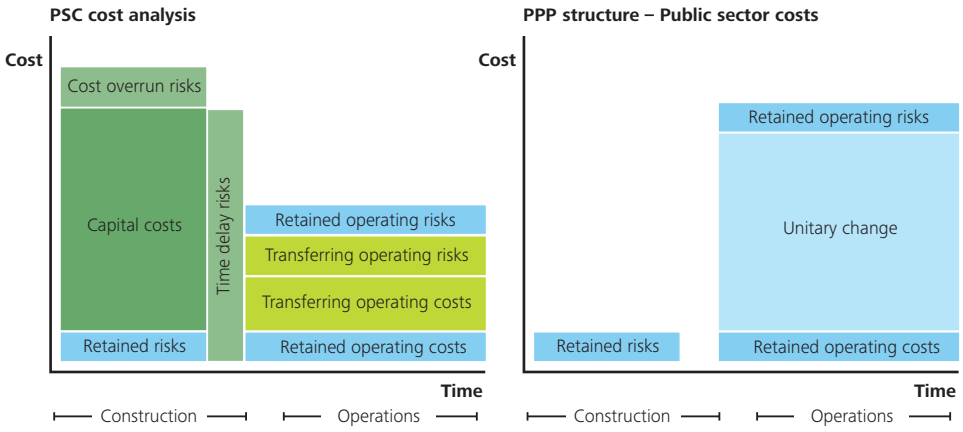
VFM assessment

The VFM assessment involves comparing the net present value of the PSC costs with the total public sector costs of the proposed PPP structure as set out in the diagram below (see figure B.1). In advance of receiving detailed costings from private sector bidders, private sector costs under the PPP structure can be estimated by developing a "shadow bid." This allows an early assessment of VFM to help to avoid spending time going to the market with a transaction that could never be justified on a VFM basis. The net present value calculation should be based on the discounted cash flow of revenues and costs over the life of the project. The discount rate used should be the long-term cost of funds for the public sector authority.

It should be noted that in some cases, VFM cannot always be quantified. Qualitative aspects should also be considered including increased quality of service, speed of delivery and the long-term nature of the contracts. Where the differential with the PSC is quite small, these issues may result in the project VFM being viewed positively or negatively.

In certain instances, the VFM assessment can be more academic in nature given that without adequate public sector funds, the project may not be deliverable unless private sector funds are made available under a PPP structure. In those cases, the PSC should still be developed and the VFM analysis carried out to better understand the potential differential between the two options were public funds available. The key decision will depend on the affordability of the private sector option relative to the level of public sector funds available. While this is not ideal, it nonetheless is a reality in many countries around the world.

Figure B.1. Value for Money assessment



Appendix C: Applying the bottom-up approach to a hypothetical case

Consider a public sector organization (the Authority) that wants to adopt the best approach for upgrading its decades-old wastewater treatment plant.

The water/wastewater PPP market has matured considerably in recent years, with numerous deals with various types of procurement structures having been completed. The Authority wants to make sure it understands all the options currently available for designing, building, financing, operating and maintaining a new plant—and of those, which is best suited to this particular project at this point in time and for the future.

The Authority wants to retain ownership and control of the facility, which immediately rules out fully privatized delivery options. So Authority officials must conduct a bottom-up analysis that looks exclusively at the following project components: design, finance, construction, service operation and ongoing maintenance. It must also look at which party might be best able to manage each component.

The overarching goals that guide this analysis include the Authority's desire to achieve an optimal risk transfer and its wish to weigh the benefit of paying construction costs up front or over the life of a project.

Step 1: Determine public authority

The first step is to survey the statutory landscape and identify any laws that may affect the types of partnership structures the government can consider. In this case, the public sector organization has the authority to involve the private sector in part or all components of the project. The public sector can involve the private sector in the finance, design, construction, service operation and ongoing maintenance components of the project if doing so provides good Value for Money.

Next, the analysis considers public perception of different partnership structures. It is possible that some special interest groups will oppose private finance in the project. But the Authority can easily mitigate potential opposition by developing a sound business case and conducting effective public outreach. In addition, the retention of ownership at all times assists in dealing with this issue. Thus, subsequent phases of the analysis focus on the following partnership structures: design-build; design-build-operate-maintain; and design-build-finance-operate-maintain. In each case, each structure is compared to the traditional procurement structure where each element is procured separately.

Table C.1. Partnership options under consideration

Partnership structure	Description
Traditional procurement	• The government owner contracts with a design engineer to develop the project design documents (drawings, quantity estimates and specifications). • The construction contractor is selected through a competitive tender, with the contract awarded to the lowest bidder. Ongoing operations and maintenance are managed and provided either directly by the public sector or by subcontractors.
Design-build	• Design and construction are bundled together and tendered as a whole. • Contracts are usually awarded based on lowest price, but "best value" evaluations are also possible. • The two key reasons to choose this approach over traditional procurement are to reduce capital costs through innovation in a competitive process, and to gain certainty by transferring design and construction cost risk from the public sector owner to the private partner. Similar to traditional procurement, post construction services are provided separately by the public sector.
Design-build-operate-maintain	• The private partner is responsible for designing, building, operating and maintaining the asset over a long period of time (such as 25+ years). • The motivation behind this type of partnership structure is to transfer the full life-cycle and operating cost risk of the asset to the private partner. The operations element needs to be of an appropriate scale to drive a real performance penalty regime because all construction funding is provided by the Authority in advance of operations.
Design-build-finance-operate-maintain	• Similar to a design-build-operate-maintain model, with the additional provision that the private partner finance all or part of the capital cost. • The repayment of the capital cost, financing costs and operating costs are rolled into a series of performance payments made by the public sector owner to the private partner over a long period of time. • Capital costs are not paid to the private partner when they are incurred but rather are financed and paid back over time, much like a lease payable based on performance. • Full life-cycle cost risk is borne by the private partner.

Step 2: Define project needs and objectives

After determining what is possible from a legislative and statutory perspective, the next step is to define the project needs and the parameters for meeting those needs. What does the plant need to do? What technology is appropriate for accomplishing this? How can the asset be delivered and maintained as efficiently as possible?

To begin, the authority needs to answer some primary questions: What does the plant need to do? What kind of volume does it need to handle? Does it need to improve on any of its existing processes? It then defines some criteria by which waste treatment technologies will be screened to determine the most appropriate one for the project, and the associated construction, operating and life-cycle costs.

It identifies the following evaluation criteria:

- Has a small footprint
- Is capable of receiving septage
- Produces a lower volume of sludge
- Is easy to operate and does not require a high level of operator training
- Uses existing building
- Is redundant (can be maintained and serviced without process interruption)
- Meets mandated effluent standards

After officials have screened existing technologies against these criteria, a preferred technology emerges. When considering the use of PPP as a procurement option, the Authority must decide whether it wishes to define the required technology solution or allow the private sector to propose technology alternatives. This depends on whether or not the Authority wants to retain design or technology risk in the project.

The next step is to think through how project needs may evolve over time and to identify some parameters that affect how the service might be delivered over the long-term. For example, how far into the future is it possible to predict the need for services? The answer to this question will affect which delivery models the organization can consider, since some of the partnership approaches are feasible only if demand for the new plant's services remains strong for quite some time or if the service delivery model will not change significantly. In this case, the organization has a long-term need for services. (See table C.2 for additional parameters identified for the project.)

Based on the project needs identified, all of the partnership options outlined above remain in the running.

Step 3: Determine the best "owner" for each project component

The last step in the analysis involves understanding who is best positioned to do what. In order to optimally allocate project responsibilities, the Authority determines the costs associated with different implementation options. It also examines public and private sector capabilities and conducts a relative risk assessment to determine the merits of bundling additional components of a project. We consider each of these in turn.

Who can and should do what?

The first step is to determine the various elements of the project and consider the relative complexity of each. Is the project overly complex (in terms of the number of stakeholders or in the nature of the project itself, for

Table C.2. Project needs considered for the wastewater treatment plant

Project needs	Question	Reason for inclusion	Answer
Efficiency	• Would the private sector be able to exploit any economies of scale that may bring efficiencies to the project?	• The ability for the private sector to exploit efficiencies not otherwise available to the public sector is a quick way to achieve Value for Money on a project.	• It is not known at this time whether partnering with the private sector will bring substantive opportunities to increase efficiency.
Degree of certainty	• Is there a high likelihood of technological change? • How far into the future can the need for services be reasonably predicted? • What is the expected life of the asset?	• Projects containing significant IT elements are generally not appropriate for PPP, as typical IT projects have a lifespan of 3–5 years, and it is difficult to predict technological advances beyond 5 years. Also, integrating different IT systems increases the complexity of the project significantly. • The services derived from the asset must reasonably be demanded over the long term to justify a PPP. • PPPs, by nature, are long term projects. So the asset should have a long expected life.	• There is low likelihood of technological change. • The need for services is long term. • The expected life of the asset is long term.
Innovation	• Is there scope for innovation in either the design of the solution or in the provision of services? Does some degree of flexibility remain in the nature of the technical solution/ service or the scope of the project?	• If bids can include innovative ideas, that increases the chance of realizing Value for Money.	• There is some scope for innovation, but this could be captured through design-build or design-build-operate partnership structures without bundling the finance component into the structure.

example) — and does it thus exceed existing internal capacity to procure or to execute? Similarly, if the project is too complex or requires significant upgrade over the life of the project, it may be too difficult to interest the private sector in assuming long-term project risks. In this case, the wastewater plant is not highly complex and can be managed effectively either in-house with existing capabilities or by the private sector.

The Authority will define the technology solution for the new treatment plant, which is relatively easy to operate and will not require a lot of operator training. Thus, the public sector will not incur large additional costs for staff training if plant operations are kept in-house. That said, the organization should consider whether operating the plant may be considered a core or strategic function. By transferring operations to a private partner, would the public sector lose a core skill that may have strategic or long-term importance? In this case, facility maintenance and operations are not considered core and thus may be bundled into the partnership model without posing a strategic loss to the organization. Reduced staffing under a private sector operations model may bring additional cost savings to the Authority if the structure is acceptable.

The next step is to determine whether it is possible to put an effective performance monitoring program in place. If the contract bundles private finance, operations and maintenance responsibilities, staff at the public organization will need to monitor performance, ensuring that the partner delivers services as the contract defines in clear, objective, output-based terms. Without effective performance monitoring, the project is less likely to deliver Value for Money. In this case, the staff currently managing the wastewater facility would have to undergo a major transformation in order to manage the performance agreement over the long term. The Authority has not conducted a similar project (one that bundles design, build, finance, operations, and maintenance components) in the past, so it has no internal experience to rely on. In addition, future opportunities to manage this type of partnership approach for other projects are unlikely, which means these performance management skills would be of benefit only on one project. However, in a PPP context, the performance monitoring and penalty deductions can be introduced and managed quite efficiently with"self-monitoring" by the private sector along with Authority check up. Performance monitoring should therefore not prevent the use of PPP; however, the use of PPP should be based on the financial and risk assessment.

Next, the organization examines whether the private sector is capable of delivering the required outcome. This step primarily involves surveying the market for similar projects and talking to known market participants to gauge interest in this project. An existing market for similar projects is likely to improve competition in the bidding process, thereby delivering additional Value for Money. In this case, there is an existing market, and known market participants have confirmed their interest in the project. Since the public sector organization is providing land, and the project is essentially a new build, the procurement process is not expected to be overly complicated

How to pay for it?

In this example, while sufficient capital is available from the public sector to finance the new treatment plant, the organization's primary financial objective is to consider which structure offers best Value for Money, including weighing the benefit of long-term annual payments against up-front construction costs and ongoing operational costs.

To assess the best partnership structure for meeting this objective, a financial analysis is conducted to determine the expected cash flows during the construction and operations phases of the project (usually considered over 20– 25 years). This analysis makes it possible to compare the relative cost for each partnership structure.

Once cost values have been calculated, they are converted to net present value (NPV) to facilitate an apples-to-apples comparison of total costs incurred (in today's dollar value). For the wastewater treatment plant in this example, we have included the financial analysis based on estimated outcomes under different procurement structures. This is typical of the analysis that should be completed by any procuring Authority when considering potential structures in advance of actual procurement. These of course can be compared with actual results when detailed bids are received.

Different private operators might use different operations models that would result in cost savings, but to avoid disorting the analysis, those potential savings have not been included. Similarly, except for reductions in procurement costs and synergies between the construction and design team costs where services are bundled, potential savings/synergies in various structures due to bundling have not been included in any significant way. The NPV calculation assumes a long-term cost of funds for the Authority of 6 percent, which has been used as the discount rate on all procurement options considered.

Table C.3 sets out the results of the financial analysis of each procurement option. Based on this analysis, it would appear that in NPV terms, either of the design-build-operate-maintain options, including and excluding private finance, offers the lowest NPV. It should be noted that some of the differential relates to the levels of risk retained by the Authority, particularly in the traditional and design-build options where only limited elements of the project are covered by fixed price contracts and performance-level requirements.

While the NPV values of the two design-build-operate-maintain options are very close, the nominal value of the option including finance is much higher. The decision to be made involves considering whether funding is available to pay for project costs as they are incurred or whether it is preferable to defer these expenditures by selecting the option including finance. Even if the required funding is available, the Authority should also consider whether this funding would be better used on other projects, allowing a greater level of project development based on the funds currently available.

Table C.3. Nominal and NPV outputs of the financial analysis

Option	Build Costs $m	Operations $m	Finance $m	Risk Value $m	Total $m	NPV $m
Traditional procurement	99.5	52.5	—	15.2	167.2	126.6
Design-build	99.3	52.5	—	15.2	167.0	126.4
Design-build-operate-maintan	97.7	50.0	—	9.6	157.3	119.6
Design-build-finance-operate-maintain	97.7	50.0	109.9	3.0	260.5	119.7

Who should bear what risks?

The main reason for pursuing a greater role for the private sector is to achieve greater Value for Money (that is, greater economic and social benefits with lower overall risk). Value for Money is achieved principally by allocating and managing risk. That means making each party responsible for managing risk (and potentially giving that party a revenue source) through obligations in a contract or a specific piece of legislation.

In this project, several risks were identified as key, meaning they were likely to occur, and if they did, they would bring severe consequences (see table C.4).

After identifying the key risks associated with the project, the Authority conducts a probability and severity assessment to estimate how likely it is that a particular risk will materialize, and how that risk will impact the total cost of the project if it does occur.

A risk plot methodology might yield the following list, with the lowest-risk model at the top and the highest at the bottom.

- Design-build-finance-operate-maintain
- Design-build-operate-maintain
- Design-build
- Design-bid-build (traditional delivery).

In this case, the design-build-operate-maintain model is only slightly riskier than the design-build-finance-operate-maintain model. The other two models carry considerably more risk.

Service providers in this sector will generally accept the risks in areas over which they have full control, for example in:

- Design
- Construction cost
- Operations
- Maintenance
- Recapitalization

Table C.4. Key risks identified for wastewater treatment plant

	Description
Government policy changes	A change in law, government policy or protocols modifies or terminates the process.
Wastewater treatment technology selection	The treatment technology proves inadequate to meet effluent requirements, requiring costly mitigating measures.
Design risk	The designed system (including all equipment) fails to deliver services at the required levels of performance and quality, because the partners failed to translate the requirements into the design. This produces additional design and system development costs.
Construction/ decommissioning activity results in contamination	Construction/decommissioning activity results in contamination of the site. This could close the site temporarily and delay contract completion.
Construction delays	The facility is handed over late and/or is late in achieving its performance goals because of delays in construction.
Failure to build to design or quality level	The project is not constructed according to the design documents (or quality requirements). This could impair performance, safety, longevity and the like.
Construction cost	Construction costs are higher than the construction contractor estimated.
Latent defects	Latent defects in new work are discovered after substantial completion and/or after warranty period.
Change order risk	Change orders are issued during construction due to design coordination/design completion/design gaps. This risk may be compounded if the contract does not fully specify the method of pricing for change orders and change order costs exceed estimated amounts.
Life-cycle maintenance – residual value	Capital and life-cycle maintenance to the structure and systems of the building is not performed when appropriate to sustain the capital value of the property and meet handover specifications.
Life-cycle maintenance costs	Life-cycle maintenance costs are higher than projected.
Effluent quality	Effluent fails to meet regulatory requirements.
Biosolids management	Risk is associated with management of biosolids, including long-term liability.
Unanticipated operating costs	Operating costs are higher than projected because of inflation or inaccurate estimates and assumptions, affecting utility and maintenance costs.
Labor supply risk	The operator may encounter labor disputes or trouble attracting and retaining staff who are suitably trained and certified.
Professional and legal liability	Key operating facility staff may be subject to litigation and claims related to negligence. Risk may affect operation of the facility, causing delays in services to the public and damage to the owner's reputation.
Site security	Site security may be breached during operations, receiving, maintenance or renewal.
Loss of operational flexibility/control (if operations risk is transferred)	Operating processes, procedures and standards may lack the flexibility required to operate plant optimally.
Default of operating contractor (if operations are bundled into the contract)	The operating company may default or go bankrupt.

Experience to date indicates that the private sector can easily manage these risks. Private sector partners will not take full responsibility for risks in areas where they do not have control, for example:

- Latent defects in existing infrastructure
- Regulation

Latent defect risk probably will not be significant for the project, as little of the existing plant will be used in the new plant.

Results of the bottom-up analysis

After analyzing the relative risks and costs of the different delivery models, determining potential market interest in the project and surveying internal and external capabilities, the organization reaches the following conclusions:

- Design-build-finance-operate-maintain is the lowest-risk option (although only marginally lower than design-build-operate-maintain);
- Design-build-finance-operate-maintain is the most expensive option in nominal terms due to financing costs; however, it is in line with the lowest cost in NPV terms; and
- Potential private sector efficiencies for construction and operations along with competitive price pressures could be achieved when detailed bids are received that would further reduce the overall cost.

Because a properly structured design-build-finance-operate-maintain structure puts the private sector service provider's capital at risk (that is, non-performance penalties can prevent it from recovering its capital investment), this model can provide a stronger performance incentive than a design-build-operate-maintain structure. Given the small difference between the two "full service" options, the use of the option including finance may provide the greatest overall benefit.

If the organization is not able to manage and monitor a long-term performance arrangement with a private partner, the project is less likely to achieve Value for Money. The government must acquire the skills necessary to manage performance. This should be achieveable, and improved performance monitoring should result in better service provision.

Thus, in this instance, a partnership approach that bundles the design, build, operate, finance and maintain components of the project appears to best meet the public sector organization's needs and to offer the greatest Value for Money.

Endnotes

[1] Top Executives Say Current Infrastructure Investment Won't Support Business Growth, Says KPMG Study," PRNewswire, January 14, 2009 <http://news.prnewswire.com/DisplayReleaseContent.aspx?ACCT=ind_focus.story&STORY=/www/story/01-14-2009/0004954443&EDATE>.

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[7] Colin Duffield, "National PPP Forum – Benchmarking Study, Phase II: Report on the Performance of PPP Projects in Australia When Compared with a Representative Sample of Traditionally Procured Infrastructure Projects," Melbourne Engineering Research Institute, University of Melbourne, December 17, 2008 <http://www.pppcouncil.ca/pdf/australia_benchmarking_survey_12172008.pdf>.

[8] The use of land and development opportunity as part of the consideration for services and infrastructure assets generally requires a strong property market. In the current economic climate, depending on the location, this may be challenging. However, as long as valuation expectations are reasonable on all sides, then these options may be considered.

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