Enabling Development of the Transportation Public-Private Partnership Market in the United States

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Abstract: Public-private partnerships (PPP) for infrastructure development and management have received significant attention in academic, institutional, and political circles over roughly the last two decades. This attention was prompted, to a great extent, by early experiments with PPP-type arrangements in Australia, Canada, and the United States coupled with the United Kingdom's Private Finance Initiative policy—not to mention the experience of other parts of the world such as Asia, continental Europe, and South America. PPP policies and practices have evolved in other world regions, but the United States remains a relatively slow mover in this market. While varying explanations for this circumstance are plausible, the situation can play to America's advantage since the nation can capitalize upon the tested experience of its international counterparts. Drawing upon data and information collected from two principal sources: (1) case histories of PPP projects in North America to date and (2) a scanning tour of Australia, Portugal, Spain, and the United Kingdom in 2008, misconceptions regarding PPPs are clarified, contemporary international policies and practices are characterized, and recommendations for implementing PPPs for transportation infrastructure are made. The principal intent of this paper is to trigger a dialogue about PPPs and how they might improve America's infrastructure assets.

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Introduction

Throughout the initial stages of the 21st century, the ingredients for expansion of the infrastructure public-private partnership (PPP) market in the United States finally appeared to be coming together. The combination of: (1) stressed and antiquated infrastructure systems across the country; (2) the government's general reluctance to raise taxes for infrastructure programs; (3) the presence of international and domestic private enterprises willing and able to deliver infrastructure systems and services; (4) the emergence of infrastructure funds as a source of equity financing for infrastructure projects; and (5) the recognition by institutional investors of the potential of infrastructure investments to provide their clientele with an attractive risk/return profile, diversification advantages, and inflation-linked cash flows, was fueling significant discussion about the role and efficacy of PPPs. The economic crisis of 2008–2009, however, altered the infrastructure debate. Discussion and subsequent action turned almost exclusively toward stimulus spending. "Shovel-ready" projects overshadowed potential PPP arrangements. The credit market crisis and investor reservations slowed or halted financial transactions. Ultimately, the American Recovery and Reinvestment Act of 2009 allocated $111 billion to "infrastructure and science" to bolster the economy (Recovery.Gov 2009). Of this amount, $48 billion was directed toward transportation infrastructure with $27 billion dedicated to highways. Of this $27 billion, qualified apportions were distributed to states with the requirement that at 120 days 50% of apportioned funds must be obligated; as of early June 2009, 54% of the apportioned funds had been obligated to 4,400 projects (U.S. DOT 2009). In addition, the Transportation Investment Generating Economic Recovery (TIGER) Discretionary Grants program made $1.5 billion available for high impact transportation projects and up to $200 million can support the Transportation Infrastructure Finance and Innovation Act (TIFIA) credit program. TIGER grants will be merit based and applications are due by September 2009.

While the current economic troubles and stimulus spending initiatives have diffused the attention paid to PPPs, various indicators suggest that they will not vanish from the transportation infrastructure provision tool kit. In the fall of 2008, the Federal Highway Administration (FHWA) established the Office of Innovative Program Delivery (IPD) to provide resources to the transportation community when considering IPD strategies; one of its six program areas is PPPs. Early in 2009, Secretary of Transportation LaHood commented that addressing the nation's transportation issues would require out-of-the-box thinking like increased tolling and private capital investment (Reinhardt 2009); and the $200 million allotted to TIFIA in the TIGER program is tangible evidence of the administration's desire to leverage federal funds to support high impact transportation projects that are likely to have a mix of conventional and nonconventional sources of finance. Prior to this allocation, the TIFIA program contributed a $665 million loan toward Florida's I-595 Express project in winter of 2009; the balance of the capital for this project is provided by $780 million in bank loans and $190 million in equity, which was a positive sign that the capital markets will support strong projects (Halai 2009). While the $200 million available pales in

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Table 1. Sample of Archival PPP Literature

Topic	References
VfM and PSCs	Akintoye et al. (2003); Quiggin (2004); Grimsey and Lewis (2005); Russell and Nelms (2006)
Risk allocation and management	Vega (1997); Grimsey and Lewis (2002); Froud (2003); Quiggin (2005); Vassallo and Gallego (2005)
PPP delivery and structure	Ashley et al. (1998); Miller et al. (2000); Zhang (2005); Abdel-Aziz (2007); Vining and Boardman (2008)
PPP program analysis	Gomez-Ibañez et al. (1991); Fayard (2005); Li et al. (2005); Vining et al. (2005); Garvin and Bosso (2008)
PPP financial issues	Tiong and Alum (1997); Williams et al. (2001); Guasch and Straub (2006)
Alternative PPP structures	Engel et al. (1997); Ye and Tiong (2000); Engel et al. (2002)
Toll rates	de Rus and Romero (2004); Cheng and Tiong (2005); Athias and Saussier (2006)
Concession length	Engel et al. (2001); Ng et al. (2007); Zhang and AbouRizk (2006); Albalate and Bel (2007)
Public interest considerations	Grout and Stevens (2003); Ortiz and Buxbaum (2008)

comparison to this arrangement, this mix of financing is typical of packages where TIFIA funds are used.

Despite these signs, the PPP market in the United States is somewhat idle. Perhaps, the national economic climate has heightened concern over PPP transactions, particularly since the track record of contemporary PPP arrangements to date is rather mixed (Garvin 2007a). Indeed, political turmoil over the role of PPPs continues, as evidenced by the letter of November 4, 2008 sent by Representatives James Oberstar and Peter DeFazio of the House Committee on Transportation and Infrastructure to Secretary of Transportation Mary Peters expressing concerns over the lack of public interest protections in PPP arrangements particularly in light of the current economic crisis and tightening of credit markets (Oberstar and DeFazio 2008). Furthermore, many entrenched public and private institutions and organizations have vested interests in maintaining the status quo—the delivery and financing system for infrastructure in the United States is not necessarily broken it just needs someone to kick start its funding stream. And less than one-half of the 50 states currently have legislation in place to allow PPPs for transportation.

While frustrating to some, the relatively slow progression of the American infrastructure PPP market is not without its advantages. Foremost, this offers the nation the opportunity to capitalize upon the experience of its international peers as different levels of government craft their PPP policies and practices. This situation is not without its challenges, though. Public agencies can quickly find themselves in positions of information asymmetry when dealing with either supporting consultants or private service providers. Hence, a broader and deeper understanding of PPP arrangements for infrastructure is necessary if the public sector hopes to involve the private sector in infrastructure provision in a responsible and meaningful way. The intent of this paper is to complement the vast body of knowledge that has developed regarding PPPs in three very specific ways. First, it shall discuss common misconceptions about PPPs for infrastructure to enhance understanding. Second, it will characterize several contemporary international PPP programs to identify tested policies and practices. Finally, it will make recommendations for actions that should be taken in the United States to enable further market development. The concepts, findings, and recommendations made are drawn primarily from the writer's experience with case histories of North American PPP projects and participation in a scanning tour of PPP programs in Australia, Portugal, Spain, and the United Kingdom (U.K.) in 2008.

Background

Relevant Literature

A vast body of knowledge on the topic of PPPs has developed over roughly the past two decades. Literature on the topic may be found in archival, institutional, and popular sources. Tables 1 and 2 provide a sample of the archival and institutional literature on the subject. As Table 1 indicates, the academic community has covered a variety of topics related to PPPs, and the references cited are indeed merely a sampling of the literature. Topics range from general characteristics of PPPs down to quantitative techniques for determining concession periods. Table 2 lists some of the more practical information about PPPs from institutional sources; far more is available. Popular literature that discusses PPPs falls into one of two categories. The first is the periodicals that cover issues related to project finance and public finance such as Project Finance Magazine and The Bond Buyer, and the second are the more general periodicals. For instance, BusinessWeek ran a story following the long-term leases of the Chicago Skyway and the Indiana Toll Road, which speculated about the potential dollar value of similar arrangements for other infrastructure assets including such icons as the Golden Gate Bridge (Thornton 2007). More recently, the Boston Globe published a similar article discussing the advantages and disadvantages of a similar deal for the Massachusetts Turnpike (Bierman 2008).

Table 2. Sample of Institutional PPP Literature

Country	Source	Title
United States	Federal Highway Administration (FHWA) (2007)	*User Guidebook on Implementing Public-Private Partnerships*
U.K.	HM Treasury (2006)	*PFI: Strengthening Long-Term Partnerships*
Canada	Infrastructure Canada (2007)	*Building Canada: Modern Infrastructure for a Strong Canada*
	Partnerships British Columbia (2009)	*Understanding Public-Private Partnerships*
Australia	Infrastructure Australia (2008)	*National PPP Guidelines*
	Treasury, New South Wales (2006)	*Guidelines for Privately Financed Projects*
	Partnerships Victoria (2001)	*Practitioner's Guide*

Table 3. Case Histories in the United States and Canada

First generation cases	Second generation cases
AB 680 projects (CA)	Chicago Skyway lease (Chicago)
• Santa Ana viaduct express	Florida high speed rail system (FL)
• SR 91 express lanes	407 ETR: Solicitation 2 (Canada)
• SR 125	Hudson-Bergen light rail system (NJ)
• Midstate tollway	I-81 improvements (VA)
Confederation bridge (Canada)	Indiana toll road lease (IN)
Cedar River water treatment plant (Seattle)	JFK AirTrain (New York City)
Dulles Greenway (VA)	Lake Pleasant water treatment plant (Phoenix)
407 ETR: Solicitation 1 (Canada)	Las Vegas monorail (Las Vegas)
Pocahontas Parkway: Development (VA)	
Tolt River water treatment plant (Seattle)	

Underpinnings

With the variety of literature available, a fair question is what contribution can this manuscript potentially make? Foremost, the material presented has a strong American perspective. As Table 3 delineates, the writer is quite familiar with the case histories of PPP-type arrangements in the United States since the late 1980s and also has a far longer historical perspective as illustrated in Garvin (2007a). Furthermore, the information about PPPs provided during the scanning tour was gathered directly from over 50 public and private professionals during presentations, informal meetings, roundtable discussions, and site visits. Collectively, this information represents the perspectives of active participants in this market on both sides of the table. Hence, the material presented is current and founded upon an evenhanded appreciation of the context of infrastructure issues in the United States.

Enhancing Understanding of Public-Private Partnerships

Defining the Construct

So what is a PPP? The answer provided may depend upon who is asked. Table 4 lists the most current definitions provided by the sources listed. Interestingly, these definitions differ somewhat from those reported previously in Garvin and Chiara (2006) from many of the same sources. Some definitions suggest that a PPP is any arrangement for service between the public and private sectors, a perspective shared by Vives (2008) since "there will always be some governmental participation and some corporate or private individual participation." Perhaps, a PPP exists, then, whenever the public sector engages the private sector. Certainly, this is one perspective.

Another, however, would establish boundaries for these arrangements. Savas (2000) qualifies a PPP by describing it as "any arrangement between a government and the private sector in which partially or traditionally public services are performed by the private sector." FHWA's definition also does this, but it is still quite broad and, like Savas' definition, a point of reference is necessary to understand it. In the context of the United States, this point is likely design-bid-build, which has been the dominant delivery system for infrastructure projects for roughly the last half-century. A common element of many PPP definitions is that they are long term, contractual arrangements between the public and private sectors. The writer has previously proposed definitions in various forums (Garvin 2007b; Garvin and Bosso 2008). The proposition of a definition is motivated by the perceived need to establish a common understanding of what infrastructure PPPs *are* based upon positive investigation of PPP policies, practices,

Table 4. Various PPP Definitions

Source	Definition
HM Treasury (2009)	Public private partnerships (PPPs) are arrangements typified by joint working between the public and private sector. In the broadest sense, PPPs can cover all types of collaboration across the interface between the public and private sectors to deliver policies, services and infrastructure.
Infrastructure Australia (2008)	PPPs are defined as being where (1) the private sector provides public infrastructure and any related services and (2) there is private investment or financing. PPPs as a procurement method are part of a broader spectrum of contractual relationships between the public and private sectors to produce an asset and/or deliver a service. They are distinct from early contractor involvement, alliancing, managing contractor, traditional procurement (design and construct), and other procurement methods.
Partnerships British Columbia (2009)	A public private partnership is a partnership arrangement in the form of a long-term performance-based contract between the public sector (any level of government) and the private sector (usually a team of private sector companies working together) to deliver public infrastructure for citizens.
Federal Highway Administration (FHWA) (2009)	PPPs are contractual agreements formed between a public agency and a private sector entity that allow for greater private sector participation in the delivery and financing of transportation projects.
National Council for Public-Private Partnerships (2009)	A PPP is a contractual agreement between a public agency (federal, state or local) and a private sector entity. Through this agreement, the skills and assets of each sector (public and private) are shared in delivering a service or facility for the use of the general public. In addition to the sharing of resources, each party shares in the risks and rewards potential in the delivery of the service and/or facility.

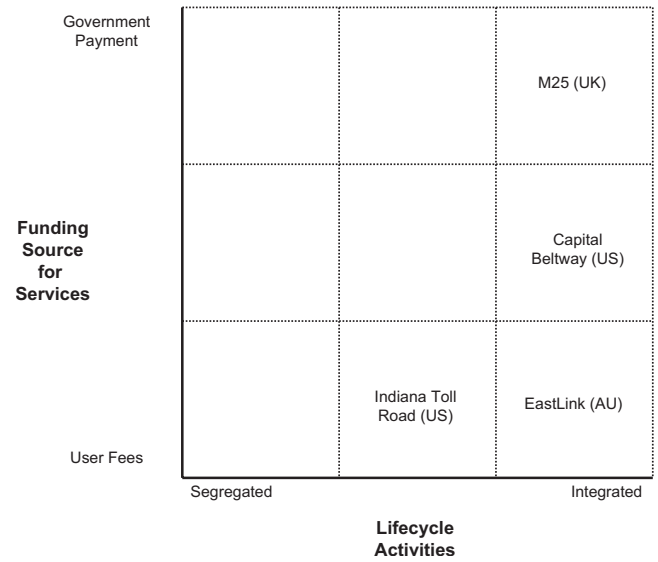

Fig. 1. Framework for characterizing project or service delivery systems

and projects. A slightly altered definition from prior versions is suggested here: *an infrastructure public-private partnership is a long-term contract between the public and private sectors where mutual benefits are sought and where ultimately the private sector provides operating services or puts private finance at risk.* This change was prompted by perspectives gained during interactions with international policy makers and practitioners during the scanning tour. The preliminary information sent to the host nations before the tour did not define PPPs; rather, the countries visited described program aspects and project examples that aligned with this definition. Perhaps, the significance of this definition is what it **excludes** as opposed to what it **includes**. Notably, this definition excludes both design-build and the sale of infrastructure assets to the private sector. While presenting some unique challenges, design-build is a modest derivative of the design-bid-build project delivery system, which is the dominant (and often mandated) delivery method for public works projects in the United States. The sale of an asset qualifies as "privatization;" this distinction is more than semantic. PPP arrangements are governed by *contracts* and the accompanying body of contract law. Privatized infrastructure is managed by *regulated* enterprises where public commissions typically have substantial governance authority.

To properly characterize PPPs, perhaps the term needs to be scrapped altogether. Possibly, a return to referring to all arrangements as *project or service delivery systems* would be more appropriate. If the infrastructure community were to do so, Fig. 1 then might help delineate the differences between the delivery systems. An adaptation of the Miller (1995) quadrant framework, this framework places "funding source" on the y axis with endpoints of government payment and user fees, and "lifecycle activities" on the x axis with endpoints of segregated and integrated. The level of integration also corresponds with the degree of risk borne by project or service providers; a single provider that is ultimately responsible for all lifecycle activities—design, construction, operations, maintenance and repair, and management—assumes substantially more risk (such as cost and performance) than independent providers of each lifecycle activity. This creates a nine-cell matrix to plot any delivery approach based upon where the funds for the project are derived and how integrated the lifecycle activities are in the service arrangement. For instance, the M25 project in the U.K. is a design-build-finance-operate service arrangement with a direct government payment that is primarily based upon the availability of service, i.e., an availability payment. This arrangement would plot in the upper right cell of the framework. Other recent noteworthy projects are also plotted within the framework. In the case of the Indiana Toll Road, it plots in the bottom middle cell since funding is exclusively from existing tolls and lifecycle activities are partially integrated since the leasing consortium has responsibility for operations, maintenance, repair, and periodic rehabilitation. While the PPP moniker probably has too much inertia to stop its use, Fig. 1 is still useful as a potential tool to differentiate the varieties of PPPs being implemented.

Dispelling Misconceptions

Private Sector Involvement in All Tasks and Phases of an Infrastructure Project Is a New Phenomenon in the United States

In a contemporary context, this is perhaps true. If one examines the nation's history, however, the facts reveal that the private sector has played a pivotal but fluctuating role. In 1796, Ebenezer Zane submitted what was likely the nation's first unsolicited proposal when he petitioned Congress for financial assistance with a project to extend a trail into the Ohio valley that crossed the Muskingum, Hocking, and Scioto Rivers and would eventually wind south to the Ohio River at what is now Maysville, Kentucky. Congress offered only a conditional grant of land in tracts 1-mi square at each river crossing as well as a franchise opportunity. Zane would be allowed to establish and operate ferries at each of the river crossings on the condition that: (1) he conducts the route survey at his own expense; (2) submits plans with his survey results to the government; and (3) produces proof that the road was complete and open and that the ferries were operating at all three sites within six and a half months. If these conditions were met and Zane provided security that the ferries would be maintained, then Congress would issue deeds to the land at the river crossings. Congress also stipulated that two judges of the Northwest Territory would set the ferry tolls. Zane took the offer and his road and ferries helped open up the interior of Ohio.

Infrastructure Public-Private Partnerships Are Principally Financial Arrangements

When the city of Chicago received nearly $2 billion for its Chicago Skyway in 2004, many saw a solution to public sector or infrastructure funding gaps. The lease or concession of certain infrastructure assets in exchange for upfront payments could provide the capital needed to fund other public requirements or infrastructure projects. This furthered the perspective of infrastructure as financial assets rather than fixed assets. Certainly, this notion is not entirely new, but this deal and similar subsequent ones helped push the financial arrangements of PPPs to the forefront.

Our international counterparts have matured beyond this perspective. Unquestionably, the financial considerations for any PPP are paramount. However, PPP arrangements, particularly in the most mature markets, are not just financial transactions; rather, they are the selected project delivery strategy based upon a value for money (VfM) or feasibility analysis. For instance, the policy in Victoria, Australia regarding any potential infrastructure project is that budgetary funds must be available to support it in order for

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it to be considered for inclusion in a capital program. If the potential project has the attributes necessary for a PPP, then it will be evaluated through Victoria's VfM guidelines (Partnerships Victoria 2001). Only if the project demonstrates VfM as a PPP will it proceed that way. Otherwise, Victoria's provincial budgetary funds will be used to finance its conventional delivery. In Spain, the philosophy is slightly different. If the public sector's feasibility analysis indicates that a PPP approach is viable, then infrastructure is typically delivered by PPPs. In either case, though, the government employs a systematic methodology to determine that a PPP arrangement is the preferred method of delivery.

Transportation Public-Private Partnerships Require the Imposition of User Fees

PPP arrangements certainly require revenue sources or rights to be granted to the contractor to support its capital, operating, financing, and transaction expenses and to provide a return on equity investments. This source of revenue, however, does not necessarily have to come from user fees or tolls. While the concept of "the user pays" remains a solid economic argument, the reality is that the sociopolitical environment domestically and abroad is a real barrier to widespread tolling. A variety of mechanisms are employed by our international counterparts to provide such funding—real tolls, shadow tolls, and direct payment mechanisms.

Public Sector Must Grant the Private Sector Maximum Flexibility in Public-Private Partnership Arrangements

In first generation PPP projects, the prevailing wisdom was that to obtain the advantages of increased private involvement and to attract private participation the private sector had to receive substantial flexibility, both technically and contractually. Among the seasoned international community, when defining or scoping a PPP project, the primary focus currently is upon identifying and conveying the outputs desired *without* inappropriately compromising existing technical standards. Outputs of a project are what its customers focus upon—reliable travel times, safe travel environment, comfortable ride, etc. The transition to thinking about what customers desire first rather than developing a prescriptive definition of an asset is a major transition in practice. However, an emphasis upon defining and measuring outputs does not come at the expense of sound engineering. The challenge is determining where to grant the private sector latitude with regard to technical issues since exceedingly restrictive technical criteria may limit private sector ingenuity and saddle the public sector with unwanted technical risks. Once the technical provisions are agreed upon, an independent verifier is used to confirm that the private sector is in compliance with the established terms.

Characterizing Key International Policies and Practices

The following sections provide general, and in some cases specific, perspectives of the policies and practices in place in Australia, Portugal, Spain, and the U.K. While the observations are related to transportation infrastructure, in particular highway assets, some are relevant to infrastructure facilities in general. For brevity and clarity, these nations are henceforth referred to collectively as "the nations visited."

PPP Program Drivers

Public agencies in the nations visited face similar challenges to those in the United States when it comes to providing serviceable infrastructure. The usual suspects—escalating demands, deteriorating assets, and insufficient public resources—are the cause of the general scarcity of funds. Another driver for those countries that are part of the EuroZone is compliance with European Union convergence criteria, which places limits on public debt and budget deficits. This pressure makes the use of PPPs, where the private partner assumes real risk, quite attractive since its associated debt is moved off the public sector's balance sheet. The nations visited, however, have used PPP arrangements as a means to leverage private sector investment in infrastructure assets, *but* **they are currently doing so through established and credible processes for identifying and selecting projects for delivery via PPP, as will be subsequently described.**

Project Analysis and Selection

A common attribute among the nations visited is the importance of long-term transportation and highway plans in their overall capital programming process. Each country has a general master transportation plan, and PPP candidate projects are typically identified from the requirements listed in the overall master plan. Another common perspective is that projects with reasonable to significant scale and complexity are often viewed as possible PPP arrangements. For instance, in the U.K. a private finance strategy must be considered first for any major highway scheme (or plan); a major scheme is currently defined as any scheme with a capital cost exceeding £7.5 million. However, schemes valued at less than £100 million are likely to offer better value if delivered conventionally. While scale can offset the substantial transaction costs involved in these projects, both attributes are likely to introduce meaningful risks throughout a project's lifecycle. Long-term risk assumption by the private partner is seen as a driver of innovative project concepts and solutions.

Generally, Portugal and Spain utilize similar techniques for analyzing and selecting projects for delivery by PPP while the U.K. and Australia employ comparable methods. Essentially, the principal difference between the pairs of nations is the justification rationale. In Portugal and Spain, a feasibility analysis is conducted during the project programming process. If the majority of a project's market risks can be transferred to the private sector in an economically viable manner, then the project is likely to proceed as a PPP. Often, the government will evaluate the expected rate of return and make adjustments to the project. If the expected rate of return for a PPP project is too high, then the government will investigate means to reduce this rate such as increasing the project's scope of work to include feeder or connector roadway segments. If the expected rate is too low, then the government will consider measures to increase the rate such as including public subsidies. Alternatively, the U.K. and Australia employ a more methodical approach where a public sector comparator (PSC) is developed, and a VfM analysis is conducted. A PPP approach is only taken generally if VfM is expected by following the PPP strategy. The latter philosophy is succinctly explained by Froud (2003) in that VfM can only be achieved if private sector expertise, innovation, competitive efficiency, and risk transfer can overcome the increased transaction, contracting, and negotiation costs—not to mention the additional need for economic profit.

Of note is the difficulty, and controversy, that surrounds the use of VfM/PSC analyses. The challenges of implementing this

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Fig. 2. Continuum of procurement processes in nations visited

methodology are perhaps best captured by comments from U.K. elected officials (Committee of Public Accounts 2003):

> Successive administrations have adopted the policy of using the PFI for those cases where the approach is expected to deliver value for money. The Prime Minister said in September 2002 that the PFI has a central role to play in modernising the infrastructure of the NHS (National Health Service)—but as an addition, not an alternative, to the public sector capital program. Yet the PFI is too often seen as the only option. To justify the PFI option, departments have relied too heavily on public sector comparators. These have often been used incorrectly as a pass or fail test; have been given a spurious precision which is not justified by the uncertainties involved in their calculation; or have been manipulated to get the desired result.

Despite such criticism, the methodology at the very least promotes the use of a systematic and auditable process, as opposed to an expedient or politically motivated one, for making a project delivery decision. In addition, it encourages a thorough business case analysis for any project, particularly large-scale endeavors.

Procurement Processes

Generally, all of the nations visited use a competitive procurement process for the selection of PPP contractors. The principal difference between the countries is the extent of negotiation that occurs during procurement. Not surprisingly, extensive negotiations during the procurement process increase both its time and cost. A basic overview of the processes in each country is depicted in Fig. 2, which arranges the four countries on a continuum ranging from a pure bid to a pure negotiation for the selection of the PPP contractor.

Spain utilizes what it calls the "open competition model" for procurement of highway PPP projects. Effectively, the government issues a call for tenders, and interested parties submit binding proposals that must comply with the call's project requirements and conditions. Respondents may offer up to three alternatives to their base proposal. No discussion between the government and the respondents occurs beyond standard requests for clarification or information. Criteria for the award are typically technical qualities and economic conditions of the proposals; other variables may also be included on a project by project basis. An award is made on the basis of the "most economically advantageous tender." Typically, a staff of approximately 20 civil servants handles multiple procurements simultaneously.

The U.K. has generally employed a negotiated procurement process for its highway PPP projects; its PFI policy allows three procurement procedures: restricted, negotiated, and competitive dialogue. The negotiated procedure is permissible when the nature of the work and its risks precludes effective pricing at the time of submission of tenders. Depending upon the scale and complexity of the project, the in-house staff and consulting advisors involved can vary significantly. The primary stages of the process are: (1) prequalification; (2) tender; and (3) contract award. The tender stage typically includes:

- Issue of tender documents which includes a model contract, instructions and guidance to tenderers, an "illustrative design" to demonstrate to its respondents that a feasible design solution for the project exists, and draft contract schedules;
- Dissemination of tender circulars and response to queries;
- Submission and assessment of tenders; and
- Identification of the provisional preferred bidder and subsequently the preferred bidder.

During the assessment of tenders, negotiations between the public sector and tenderers occur regarding such elements as contract provisions and technical requirements. Once negotiations conclude, the tenderers submit proposals in accordance with the revised contract. In the case of the M25 project, the extent of the negotiations between the Highways Agency and its three tenderers resulted in three unique contracts against which bids were made and evaluated. In this case, the evaluation followed a three stage process: a quality assessment, a pricing assessment of all tenders meeting the quality threshold, and a price/quality tradeoff.

Risk Allocation

While the subject of risk in PPP arrangements has received significant treatment in the literature, the laws, policies, and practices of the nations visited offered valuable insights into what is ongoing in the field. All of the nations emphasized effective risk allocation as an important aspect of a PPP project. Not surprisingly, the private sector bears the design, construction, operations, and maintenance risks in all of the nations visited. The handling of other risks varied, particularly the treatment of demand risk.

Demand Risk

Clearly, the demand or market risk is often problematic in PPP arrangements since forecasting traffic volumes ex ante involves multiple factors such as expected economic growth, user behavior, price elasticity, and substitute or parallel facilities. The philosophies observed in Spain and Australia with respect to this risk offer an interesting contrast.

The governing law in Spain provides that the bidding terms could establish a demand-risk sharing scheme. Essentially, the government can establish a threshold for a specific demand-risk variable and allow bidders to propose an upper and a lower boundary relative to this threshold. In addition, the government must often establish a limit for the lower boundary to ensure that the contractor will assume a significant portion of the demand risk. A traffic or revenue-based variable may serve as the basis of the forecasts. In the event that the actual economic conditions differ from the expected conditions, the contract must be rebalanced by adjusting preestablished parameters such as the toll rate. For instance, the government may choose gross revenue as the basis for the threshold and select the toll rate and the contract's duration as the parameters for adjustment during a rebalancing action. It will forecast the annual gross revenue over the contract's duration and establish a limit of 80% of the annual forecast for the lower boundary. Bidders will then propose their boundaries, which will be evaluated as part of the overall award criteria. If the winning bidder proposed upper and lower boundaries of 130% and 70%, respectively, of the threshold value, then as long as the actual annual gross revenue falls within this range no change is made to the contract. If actual gross revenue falls below

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the lower boundary, then a rebalancing must occur. An option may be to raise the maximum toll rate until such time that the gross revenue falls back within the established boundaries. Similarly, if the actual gross revenue exceeds the upper boundary, then a rebalancing action is triggered. Vassallo and Gallego (2005) provided more detailed discussion of this demand-risk handling approach.

In Australia, the philosophy regarding demand risk is quite different. All highway PPPs to date in the three states visited (New South Wales, Victoria, and Queensland) are real toll projects, and the states share the philosophy that private investors in these deals, both equity and debt holders, must bear the downside market risks. In other words, if the revenues or rates of return expected do not materialize, then the private investors must endure the consequences. The maturity of the PPP market in Australia supports this philosophy since both investors and lenders have grown comfortable with these conditions and the marketplace itself can provide remedies to financial hardships, i.e., restructuring financing arrangements, etc. Recent contracts, however, have included sharing provisions between the government and the contractor should the upside exceed predefined thresholds. This precludes "windfall" gains by the contractor, and such provisions are the direct result of social and political pressure to prevent such circumstances.

Competing Facilities

Certainly, an issue related to the demand risk is competing or parallel facilities. In the nations visited, protections afforded the private sector with regard to competing facilities are modest but disclosed. In some cases, an alternative free route is required if the PPP highway facility is tolled as a matter of policy. Quite often, the government has the right to proceed with any expansion or enhancement of the highway network that is identified in its long-range transportation plan. More generally, the most recent contracts stipulate what latitude the government is granted with regard to the actions it may take in the region of the PPP facility. For instance, the contract may identify particular corridors or roads that it is free to expand or improve. In general, the trend is toward defining within the contract what rights the government has in the vicinity of the highway facility. This practice delineates what flexibility the government has during the contract period and establishes conditions that private contractors can take into account when developing their proposals. This is a sharp contrast to the absolute protection zones afforded to the private sector in some early and existing PPP arrangements.

Contract Modification

Given their long-term nature, PPP contracts need a robust modification protocol to potentially deal with changes in law, modifications initiated by the private partner, changes to accommodate project enhancements, or revisions of service requirements. Early contracts did not necessarily provide the flexibility needed to update them over time. For instance, the Highways Agency in the U.K. is currently in the process of negotiating major changes in contracts signed in 1996. This arduous process has caused the Agency recently to adopt a two-tiered contract modification strategy. In the case of a major change, a contract review will occur, which may necessitate negotiation of a new contract. The M25 project is the first to include this contract review condition. Otherwise, a step-change process has been included within the contract, so that more standard modifications can be handled within the existing agreement. Australia typically negotiates contract changes on an as needed basis, but it has also generally established processes for handling both major and minor modifications to the contract. Contracts there originally included fairly liberal "material adverse effect" provisions in the event of changes in conditions; more recent contracts have tightened up these provisions generally to a more limited set of specific events.

Spain employs the rebalancing action, discussed previously, to handle a variety of conditions that may disrupt the project's economic-financial equilibrium; Portugal follows a similar approach. In addition to demand conditions differing from those expected, a rebalancing action may occur for example if the government enacts a new law or regulatory standard. Rebalancing is not triggered immediately; two conditions must be met. First, the change in conditions must produce a substantial material effect upon the party impacted. Second, this effect must be sustained over a reasonable period of time. The rationale for this rebalancing concept is basically twofold: (1) the public and private sectors enter into the PPP agreement for the general public good using the best information available at the time of the agreement and (2) this practice supports "win-win" outcomes, which promotes stability in the market.

Contract Management

General Overview

Given that the PPP contracts observed ranged from 25–50 years with the typical term being somewhere between 30–40 years, the relationship between the public and private sector is indeed a long-term one. This circumstance puts managing the partnership at the forefront. Clearly, the partnership arrangement most tangibly manifests itself in contract management practices. These practices are split into the capital delivery and operations phase. During design and construction, all of the nations visited employ an independent verifier who serves as an objective third party to generally administer and review the project. Payment policies for the independent verifier varied among the countries. In most cases, the government and the PPP contractor share this cost. In one case, however, the PPP contractor covers this cost up to a threshold amount, above which the cost is then shared. Since the verifiers are often paid on a fee basis, the logic here is that higher verification costs indicate inadequate performance on the PPP contractor's part, so bearing this cost serves as an incentive.

While management of capital delivery is certainly important, the crux is contract management during the operations phase. In the U.K., this responsibility is held by the Department's Representative (DR). Essentially, the DR has three key roles: (1) performance monitoring; (2) financial monitoring; and (3) contract administration. On the surface, these appear quite similar to those of an owner's representative on a typical construction project. If one scratches below the surface, however, it becomes clear that the DR must carefully balance the relationship with the PPP contractor with the intended contract requirements, risk allocation, and service standards—over a substantial period of time. In particular, the DR must recognize who holds what risks and act accordingly so that the DR's actions do not inadvertently make the public sector liable for a risk allocated to the PPP contractor. Moreover, the DR must do this with a very modest in-house support staff. Similar positions are staffed in the other countries visited, such as the government delegate in Spain.

Performance Measures

Unquestionably, performance measures or key performance indicators (KPIs) are central to the most recent PPP projects observed

Table 5. Examples of KPIs in Spain

KPI area	Measurement
Safety	$A = N \times 10^8 / L \times 365 \times$ AADT, where A = accident rate; N = number of accidents with victims; L = length of highway under management (km); and AADT = average annual daily traffic. The accident rate is compared with the previous year's rate; an increase results in a penalty while a decrease results in a bonus of up to 5% of the annual service payment.
Heavy vehicles	IF at least 90% of time during the first 35 years of concession, at least 35% of total heavy vehicle traffic in the corridor use the highway AND at least 90% of time during the first 35 years of concession, at least 40% of total heavy vehicle traffic use is during night time, THEN concession period is extended 1 year
Winter weather conditions	Road closure = €1,800/h in fines. Tire chains required = €600/h in fines

in the nations visited. Each country utilizes KPIs to generate the outcomes that it desires for its PPP projects, and they are the basis for incentives and penalties—primarily during the operations phase of a project. In most cases, KPIs are used to define target levels of performance, and KPI schedules specify formulas for the calculation of metrics or points that serve to determine whether or not these targets are being met.

For instance, Spain has used KPIs to manage safety, heavy vehicles, congestion, winter weather conditions, and toll collection times, as well as other elements. Table 5 provides some example indicators. In some cases if the PPP contractor can maintain or exceed the level of performance specified for the majority of the contract term, then the contract period will be extended by a predetermined number of years. In this respect, the incentive is backloaded. In Victoria, Australia's most recent highway PPP—EastLink—the Victorian government created an extensive KPI regime that focused upon customer service, road maintenance, landscape and environment, and tolling accuracy. If performance thresholds are not met, the concessionaire may be at risk financially up to $17 million annually. The concessionaire is required to distribute any such abatement amounts to EastLink's customer account holders in the form of toll credits, rather than being paid back to the government.

Recommendations for the U.S. PPP Market

Normalization

One of the advantages that many European nations have is that their PPP program is driven primarily by the national government. This creates consistency and stability for the market across the nation. The same is not true in Australia where the state governments have played the leading role. The situation in the United States is obviously similar. While autonomy among the states has certain advantages, the nation cannot have 50 unique markets for PPPs; this would deter private participation and drive up transaction costs. Thus, some level of standardization is necessary. States will likely want jurisdiction over infrastructure projects (which seems reasonable since they are footing most of the bill for it these days), but some standardization in procurement processes and contract provisions is essential. While FHWA has made efforts to produce model enabling legislation and PPP program guidelines, more work in this area is needed.

Interestingly, the Australian states have incrementally standardized themselves. New South Wales moved first and the Victorians followed. Despite the friendly rivalry between the two, they have learned from each other as their programs have evolved. Now, Queensland has recently gotten involved in the PPP market as well, and they have borrowed knowledge acquired from their sister states and used it to their advantage, even going so far as to utilize public personnel from other states in the procurement process. A similar approach in the United States could prove beneficial. Notwithstanding the good that federal agencies can do in this regard, states can work together through organizations such as AASHTO or American Water Works Association to educate one another. Early movers such as Virginia, Florida, Texas, and North Carolina can undoubtedly improve the market's reliability by identifying and sharing best practices with one another.

Education

America needs an incremental but aggressive public agency education program. The nations visited emphasized the importance of building and improving institutional capacity for PPP program effectiveness. From business case analysis through handback, PPPs present a variety of challenging tasks for public sector officials. As their PPP programs have matured and their staff capacity has increased, the nations visited have relied less heavily on external consultants. This capacity has not been derived simply through experience. Rather, deliberate actions such as establishment of best practices groups, development of principles and guidelines, and creation of standard procedures have all contributed to this growth. Certainly, the need for complementary specialized expertise in areas such as legal and financial matters will not cease. However, the institutional infrastructure required to conceptualize, procure, deliver, and manage PPP arrangements as they themselves continue to evolve is significant.

Experienced public and private representatives from the international community should be brought to the United States **now**. While PPP forums and workshops are quite frequent, these are often not heavily populated with public officials. Currently, a handful of state DOTs have active PPP programs or are seriously considering them. FHWA should target these states initially for workshops where public executives, procurement officers, and contract managers from countries like Australia, Chile, Ireland, Portugal, Spain, and the U.K. speak with their U.S. counterparts regarding: (1) establishing PPP policies and programs; (2) identifying candidate PPP projects; (3) conducting business case analyses to determine the proper delivery strategy; (4) defining project outputs and metrics; (5) procurement processes and project delivery; and (6) contract/partnership management. Unfiltered, firsthand accounts of experiences would allow these states to identify what might be appropriate for their own contexts and then act accordingly.

With support from the FHWA, these states could become a "leading practice" group and convene regularly to share knowledge while open to additional members. When well established, this group could naturally evolve into a special committee within AASHTO or a technical section within one of its subcommittees. Throughout, the FHWA should function as a resource and enabler. It has the capacity to facilitate interstate activity while also publishing guideline policies and documents. This role is consistent with the normalization recommendation just discussed; the challenge is providing the global framework to stabilize the PPP market without usurping state autonomy or knowledge.

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Shift in Mindset

The necessary public sector mindset for successful PPP programs and projects is markedly different from conventional practices. The shift necessary stems from the fact that PPPs for all intents and purposes are enterprises, which require a careful combination of technical, legal, and commercial conditions. This is fundamentally different from prescribing the requirements for a constructed facility, which is typically done in conventional project delivery. Instead, the public sector is granting the private sector the right to initiate and operate an enterprise within the bounds of a contract. Accordingly, a careful balance must be struck between the project's business and engineering provisions so that the private partner can succeed while also satisfying the public sector's objectives.

Conclusions

The transition to a world where a nontrivial percentage of infrastructure services is provided by the private sector will eventually occur. Essentially, governments will become the overseers of such service rather than the service providers—i.e., "steering versus rowing." The international community has learned that their highway PPP programs must preserve the public's interest *and* attract private participation. To some, these may be conflicting objectives. Balancing the two for PPP projects, however, essentially requires that the state and its citizens:

- Receive a reasonable price; and
- Obtain a marginal value or benefit.

Likewise, private participants require:

- Reasonable risk/reward profiles, and
- Manageable transaction costs.

Previous sections have highlighted various practices used by the nations visited that facilitate these outcomes. For instance, public sector project and business case analysis methods help to identify drivers of lifecycle value as well as appropriate risk allocation strategies. Emphasis upon project outputs enables public decision makers to pinpoint customer needs and to target KPIs to satisfy those requirements. Competitive procurement processes that: (1) employ phased approaches to filter potential respondents down to a selected few or (2) fix project requirements and bid parameters, improve transparency and accountability while driving down transaction costs.

Will the United States become a major market for PPPs and will this transition be beneficial? It is time to reduce the rhetoric about PPPs in the United States. Our international counterparts are using these arrangements effectively to deliver needed infrastructure. The nation should feel comfortable that it can do the same, so long as public agencies select, analyze, structure, and procure these projects thoughtfully. The knowledge gap with the international community must be closed. Otherwise, the gap that may develop will present challenges that are far more difficult to handle.

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