High-Speed Rail: Public, Private or Both?

Assessing the Prospects, Promise and Pitfalls of Public-Private Partnerships

MASSPIRG Education Fund

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Executive Summary

Private sector companies are likely to play a major role in the construction of high-speed rail lines in the United States. Even as California nears construction of the nation's first high-speed rail line, however, it remains unclear just how the private sector will participate in building out the nation's high-speed rail network.

Public-private partnerships—or "PPPs"—have come to play an important role in the construction of high-speed rail lines around the world. In a PPP, the public and private sectors are supposed to share the risks, responsibilities and rewards of infrastructure development.

The experience with high-speed rail PPPs around the world, however, has been mixed. While PPP arrangements have brought private capital and expertise to the task of building high-speed rail, PPPs have also resulted in cost overruns, government bailouts, and other serious problems for the public.

America must learn from these experiences and pursue PPPs only in situations in which they make sense—and do so in keeping with a series of key principles designed to protect the public interest.

Public-private partnerships will likely be part of the development of high-speed rail in the United States.

- High-speed rail systems require billions of dollars in financial capital, which cash-strapped state and federal governments are likely to seek through partnerships with the private sector.

- California is moving forward with the creation of the nation's first true high-speed rail system, and it is required by ballot initiative to obtain private investment in the project.

- Amtrak is seeking to involve private investors in its plan to bring true high-speed rail service to the busy Northeast Corridor.

- The U.S. Department of Transportation has signaled that private investment will play a key role in achieving President Obama's goal of linking 80 percent of the U.S. population via high-speed rail by 2035.

All high-speed rail public-private partnerships require substantial public investment.

- No modern high-speed rail line has ever been built with only private capital. In several recent and current European high-speed rail PPPs, the public sector has been responsible for more than half the capital cost of the high-speed rail line.

No two public-private partnerships are alike.

- There are countless varieties of high-speed rail PPPs, meaning that each such partnership is unique and must be evaluated on its own terms.

Public-private rail partnerships have the potential to unlock access to private capital, expertise, technology and economies of scale, and can also help mitigate the risk of high-speed rail projects to taxpayers. However, PPPs also come with a number of risks and costs, including:

- Higher costs for capital, as well as costs related to the profits paid to private shareholders.

- Heightened risk for the public once a project has begun, due to the ability of private-sector actors to hold projects hostage and demand increased subsidies or other concessions from government.

- The costs of hiring and retaining the lawyers, financial experts and engineers needed to protect the public interest in the negotiation of PPP agreements and to enforce those agreements over time.

- Loss of control over the operation of the high-speed rail line, which can result in important transportation assets being operated primarily to boost private profit rather than best advance public needs.

- Delays in the early stages of a project, as government and private partners engage in the difficult and complex task of negotiating PPP agreements.

High-speed rail PPPs and efforts toward rail privatization abroad have a mixed track record.

- In Taiwan, the government's efforts to pursue a fully private-sector built and financed high-speed rail line fell apart—despite rising ridership—as the private company responsible for building the line faced a financial crisis caused by its reliance on high-cost debt. The Taiwan government ultimately stepped forward to bail out the company and refinance its debt.

- In the Netherlands, a series of problems led to massive cost overruns in the construction of a high-speed rail line, most of which became the responsibility of the government. The PPP process was characterized by illegal collusion among bidders for the construction contracts, poor coordination among the various contracts, and unexpected delays that required the government to provide emergency bailouts.

- In Great Britain, an effort to privatize the operation of the nation's rail infrastructure led to a decline in the system's safety. Excessive use of contracting, coupled with poorly designed incentives, caused delays in the response to known safety problems and a massive backlog of critical maintenance projects—problems that contributed to a deadly train accident

in 2000. In the wake of that accident, the formerly private infrastructure provider was reorganized as a government-regulated non-profit.

- Portugal engaged in thoughtful development of a PPP strategy for construction of its high-speed rail system. However, Portugal's high-speed rail program still required a large investment of public resources and the nation may be responsible for paying financial compensation to its private sector partners if it pulls back on its high-speed rail construction plans in the midst of a devastating financial crisis.

Public officials should use a set of common-sense principles to evaluate public-private partnerships—and should refuse to pursue PPPs that do not serve the public interest.

The principles that should guide government's approach to high-speed rail PPPs are:

1) **Governments must only pursue PPPs for the "right" reasons**, such as the ability to deliver a public project for lower price or with higher quality—rather than use PPPs to avoid budgetary discipline or compliance with labor standards or other regulations governing public projects.

2) **PPPs must deliver added value for the taxpayer**, as measured by a comprehensive test that includes all the relevant costs of a high-speed rail project.

3) **PPPs must align private sector incentives with public sector goals**, ensuring that private sector partners experience penalties and rewards that forward the public's interest in timely and cost-effective completion of the project and effective and safe operation.

4) **PPPs must only be pursued where ample competition exists** for the service being put out for bid.

5) **PPPs must only be pursued by competent, well-prepared governments** with the ability to defend the public interest in contract negotiations and to properly monitor and enforce contracts as they are carried out.

6) **There must be clear public accountability in PPP projects**, with one government agency responsible for overseeing the project and holding contractors accountable for their performance.

7) **The public must retain control over key transportation-system decisions**, ensuring that high-speed rail lines are built and operated in ways that are consistent with the public interest rather than the maximization of private profit.

8) **PPP projects must not impose unreasonable limitations on future government action**, such as the "non-compete" clauses in some toll road leases that forbid government from improving other nearby transportation facilities.

9) **PPP contracts should be of reasonable length**, with contracts for the operation and maintenance of long-lasting infrastructure being longer than contracts for trains, communications equipment and other items with faster turnover.

10) **There must be complete transparency in the PPP contracting process and in the execution of PPP**

contracts. When there is a conflict between public right to be informed and private investors' confidentiality rights, the former should prevail.

Government agencies considering PPPs should understand that even well-crafted PPPs are not a panacea—and that a strong government commitment to the project is likely necessary to draw productive private investment. Specifically:

- Governments should be prepared to undertake extensive early planning and environmental review of a project before submitting it to bid, in order to reduce project uncertainties and increase the comfort of private actors in submitting competitive bids.

- Governments should be prepared to reduce the risk of cancellation of a project mid-stream by providing full-funding grant agreements that provide a multi-year commitment of government funds.

- Governments should acknowledge that public investment is necessary for the completion of a high-speed rail project and understand that even "private" rail proposals are likely to impose public costs, particularly in the event of a threatened private-sector default.

Introduction

America's emerging push to build high-speed rail has taken its share of lumps in the past year. Newly elected governors in Ohio, Wisconsin and Florida shelved rail projects for which billions of dollars in federal funding had already been allocated, while congressional negotiators have imposed significant cuts to the federal high-speed rail program.

These setbacks—difficult though they may be—are likely only temporary. Rising oil prices, increasingly crowded highways and airports, and the demands of a 21st century knowledge economy all demand that the nation pursue improved passenger rail service, including the construction of new high-speed rail lines.

California is now poised to build the nation's first true high-speed rail line, with construction on the first segment of the line due to begin in 2012. As California's high-speed rail system moves ahead, the discussion has begun to turn from the question of whether to build high-speed rail to the question of how to build it.

Among the most important of the issues that must be resolved—both in California and in other high-speed rail projects around the country—is the question of how best to divide roles between the public and private sectors. The multi-billion dollar cost of high-speed rail lines provides a powerful incentive for government agencies to find private-sector partners willing to share in project financing and in the assumption of risk. These public-private partnerships—or PPPs—have become common around the world as a means of building large infrastructure projects, including high-speed rail lines. But the experience with PPPs in the development of high-speed rail has been decidedly mixed—characterized by both apparent successes and grand failures.

It is not too soon for the United States—and especially California—to learn from the experiences of high-speed rail PPPs abroad, to develop principles that will enable public officials to determine whether a PPP is the right way to approach a particular project, and to structure PPP agreements that protect the public interest.

Public-Private Partnerships: What They Are and Why They Matter

The United States is in need of new transportation solutions. Our highways and airports are increasingly congested, making travel, even between cities just a few hours apart, inconvenient and frustrating. Meanwhile, our reliance on oil continues to threaten our economy, our national security, and our environment.

High-speed rail is a potential solution to many of these challenges. Americans are excited about the prospect of a clean, efficient new means of travel; nearly two-thirds of Americans support federal or state funding for high-speed rail.[1]

But the American people aren't the only ones enthusiastic about high-speed rail. Businesses from around the globe are eager to compete for the billions of dollars in infrastructure spending that will accompany the nation's investment in high-speed rail.

In 2009, 30 companies from around the world committed to establish a presence or expand their existing presence in the United States if they are chosen to supply components for high-speed rail.[2] Prior to its cancellation, the Florida high-speed rail line attracted interest from seven teams including dozens of firms from around the globe.[3] In California, a request for expressions of interest from private firms drew more than 1,000 responses, while 22 funds have expressed interest in financing part of the system's construction.[4]

The construction of high-speed rail in the United States will inevitably involve both the public and the private sector. Effective "partnerships" between the public and private sectors are critical if the nation is to get the high-speed rail network it deserves at a price it can afford.

Public-Private Partnerships and their Role in High-Speed Rail

The term "public-private partnership" (PPP) is vague. In the broadest sense, it can be construed to include almost any part of the economy. In the most commonly used sense, however, PPPs are arrangements in

which government and private sector firms share in a project's risks, responsibilities and rewards.

PPPs are distinguished from traditional government contracting in that the private sector partner is more integrally involved in a project's development and execution than as a "contractor for hire." Private-sector firms might be involved in helping to design a piece of infrastructure, finance it, or operate it once construction is complete.

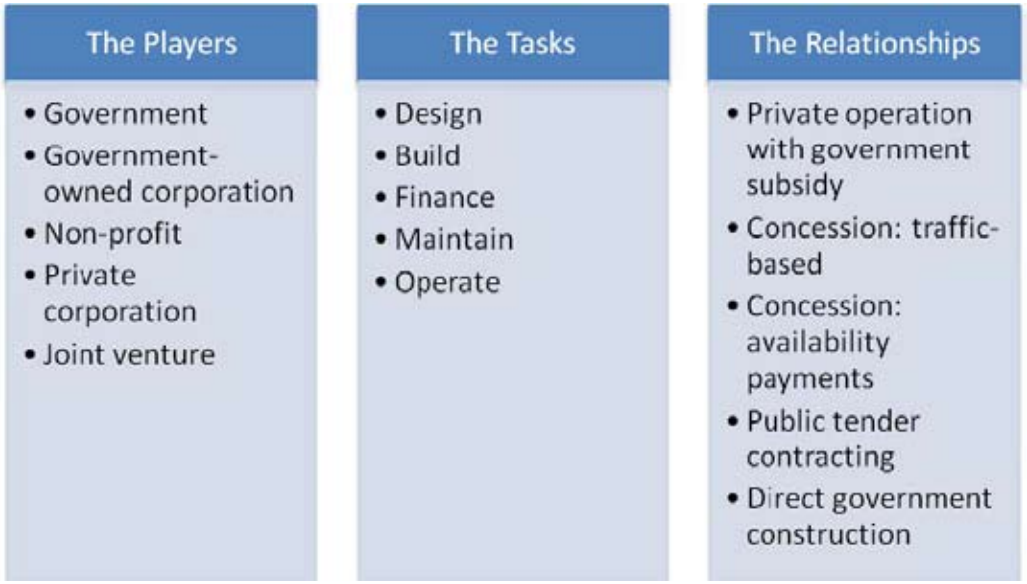
In the American context, there are two types of public-private partnerships that are likely to come into play in development of the nation's high-speed rail network. The first type involves partnerships between the government and the owners of existing freight railroads that are proposed for upgrades in the federal high-speed rail program. Many of the initial high-speed rail projects approved for funding under the 2009 American Recovery and Reinvestment Act (ARRA) fit into this category, representing incremental improvements in service on existing rights of way owned by incumbent freight railroads. Any attempt by the government to encourage high-speed rail service on these existing lines will likely require regulations paired with government provision of either subsidies or capital investments to entice freight railroads to accommodate high-speed passenger services on their tracks.

These partnerships—while critical to the development of an effective passenger rail network for America—are not the focus of this report. Instead, we focus here on the use of public-private partnerships for the construction of high-speed rail lines on new rights of way.

These projects—which include the California high-speed rail network, the proposed construction of a true high-speed rail system in the Northeast, and the previously proposed Florida network—are likely to be the most expensive projects in the development of the nation's high-speed rail system, but also the projects with the greatest impact.

It is critical—both for the protection of the public purse and for the future of the nation's high-speed rail program—that these projects be managed and executed effectively. As a result, it is important that the nation approach the use of PPPs in the realization of these projects with care.

Figure 1. Potential Players, Tasks and Relationships in High-Speed Rail PPPs



Who Pays for Public-Private Partnerships?: The Myth of "Privately Funded" High-Speed Rail

Government officials and the media sometimes believe that privatization enables the public sector to get something for nothing—brand-new infrastructure paid for entirely through private-sector investment. In the case of high-speed rail, there has been no such thing as a fully privately funded modern high-speed rail line anywhere in the world.

Recent high-speed rail lines built or begun in Europe have typically required government entities to pay more than half the costs of the project. For instance:

- The Netherlands' HSL-Zuid line —which links Amsterdam and Rotterdam in the Netherlands to Belgium—relied on the public sector for 86 percent of its budget. [5]

- The Perpignan-Figueres high-speed rail connection between France and Spain benefited from a public investment of 57 percent of project costs.[6]

- The initial segment of Portugal's high-speed rail network is projected to be built with 55 percent of its budget coming from public sources.[7]

- The new Tours-Bordeaux high-speed rail line in France will be built with 50 percent public investment from France and the European Union.[8]

Even projects that were originally intended to be fully privately financed—such as Great Britain's High Speed 1 line and Taiwan's high-speed rail system—eventually benefited from heavy government investments in the form of loan guarantees and the purchase of partial or full ownership of the companies that built the lines.

As American policy-makers consider how to finance future high-speed rail investments, they must remember that PPPs do not provide a "free lunch." The capital-intensive nature of high-speed rail development—coupled with the difficulty of projecting future ridership—means that private investors are unlikely to take on the full financial responsibility of building a high-speed rail line.

Public investment in high-speed rail has been necessary everywhere it has been built. Often, however, that public investment can be justified by the myriad long-term public benefits—economic, environmental, energy security-related and more—that accrue from high-speed rail construction.

Models of Public-Private Partnerships

As noted above, the term "public-private partnership" is vague, and can be used to describe many different types of relationships among public, quasi-public and private sector firms. Indeed, the number of possible combinations of participants, relationships and divisions of responsibility in PPPs is sufficiently vast as to make every such arrangement unique.

The Players

At first blush, the definitions of "public" and "private" in a public-private partnership seem clear: a "public" entity is the government; a "private" one a corporation. In reality, however, there are a variety of potential players in PPPs—some of which fall into the hazy middle ground of "quasi-public" organizations, which blend the attributes of public and private sector entities.

Among the potential players in a PPP are the following:

- **Government agencies**: Government agencies can play two roles in PPPs: as investors and participants. All high-speed rail projects in other countries involve public investment of some kind. Indeed, it is not uncommon for several different governmental entities to invest in a high-speed rail project—in Europe, for example, the European Union and individual nations often invest resources together in high-speed rail (sometimes with additional contributions from local governments), and the same can be expected for state and federal governments in the United States. Far fewer projects, however, involve government agencies as the direct builders or operators of high-speed rail systems, with those roles often being left to government-owned corporations (see below). China is perhaps the prime example of government participation in high-speed rail construction. In China, all rail projects (including high-speed rail) are carried out by a government ministry.[9] The construction and maintenance of the lines are usually paid for with public funds or government bonds.

- **Government-owned corporations:** Government-owned corporations—sometimes called state-owned enterprises—are by far the most common drivers of high-speed rail construction internationally. These are organizations that are accountable to the government but operate as businesses. Amtrak in the United States is an example of a government-owned corporation[10], as are the state-owned railways in many nations that have taken leadership in the development of high-speed rail, such as those in France, Spain and Germany. While government-owned corporations are often heavily influenced by government in their core business activities, they often have latitude to branch out to other lines of business or to the provision of rail service in other countries.

- **Non-profit corporations**: A less-common participant in rail operation is the state-chartered non-profit corporation. The main example of this type of "player" is Great Britain's Network Rail, which manages the nation's conventional rail infrastructure. Network Rail acts as a non-profit agency, funneling all revenues from its management of the country's rail infrastructure back into stations and tracks. Non-profit corporations can also act as investors in for-profit high-speed rail operations—Britain's High Speed 1 rail line, for example,

is currently operated by a consortium that includes the Ontario Teachers' Pension Plan.[11]

- **Private corporations:** Private corporations—accountable primarily to their shareholders—are also potential participants in high-speed rail operations. In Japan, the *Shinkansen* high-speed rail network (much of which was built by Japan National Railways during its days as a government-owned firm) has been privatized, with six large, regional, privately-owned companies responsible for operating high-speed rail service.

- **Joint ventures:** Finally, any of the above categories of actors may join forces in a joint venture, which itself can be a party to a PPP. In the Netherlands, for example, the concession for operation of trains on the HSL-Zuid high-speed rail line was granted to a joint venture called High Speed Alliance, 90 percent of which is owned by the state-owned Dutch national railway, NS, and 10 percent of which is owned by Air France-KLM.[12] An arrangement between the Dutch government and a firm 90 percent owned by the Dutch government, therefore, holds the appearance of a public-private partnership, but is actually closer to a public-*public* partnership.

The Tasks

The construction and operation of a high-speed rail line is a massive logistical, engineering and construction feat, involving the organization of vast amounts of capital and thousands of laborers in a complex array of tasks over the course of many years. The tasks involved in building a high-speed rail line can all be the responsibility of a single entity, or they can be distributed among many participants.

The necessary steps in the construction of a high-speed rail line include:

- **Finance:** High-speed rail lines are typically multi-billion dollar projects that require the assembly of capital from a variety of sources, including various government entities, publicly-owned firms, and private investors.

High-speed rail lines are complex systems, involving the construction of civil engineering works, the laying of tracks, the operation of trains and stations, and the development of effective signaling, communications and safety systems. Credit: flickr user mostlybytrain, photo used with permission.

The responsibility for financing a high-speed rail line may be carried out by the government or assigned to a private entity as part of a larger PPP.

- **Design:** Design of a high-speed rail line includes decisions on routing and station location, as well as technical specifications of civil engineering works (grading, tunnel boring and bridge construction), tracks, signaling and stations. Public entities typically engage in at least some level of design—at minimum, choosing the route—even in projects in which private-sector entities are responsible for detailed design. In addition, government agencies are typically responsible for reviewing the design for consistency with environmental and other regulations, often with a large degree of public input.

The Ingredients of a High-Speed Rail System

Another dimension of complexity in high-speed rail PPPs is the division of labor for construction of the system. A high-speed rail line may be seen either as a single, integrated entity, or as a collection of "ingredients" for which the responsibility can be split among a number of contractors. Among the ingredients of high-speed rail projects are:

- **Civil engineering works**: These are the basic public works over which a high-speed rail line travels, including the graded rail bed, tunnels and bridges.
- **Tracks**: These are the physical structures of the rail line, including rails and power systems.
- **Communications and signaling**: These are the systems that enable rail service to operate safely over a given set of tracks, including communications, signaling and train protection systems.
- **Stations:** Including related amenities such as parking lots, restaurants and shops.
- **Rolling stock**: Including the high-speed trains themselves and other maintenance equipment.
- **Maintenance facilities and equipment**

A final "ingredient" of high-speed rail service might be called "**systems**." Each of the above categories represents a set of tangible assets that must be built, maintained and operated individually for a high-speed rail system to run smoothly. However, these categories do not include the information and other components that enable these assets to mesh together as a coherent system—for example, scheduling, ticketing, coordination of maintenance schedules, and management.

- **Construction**: Construction of a high-speed rail line includes basic civil engineering work, laying of track and installation of power systems, design and implementation of control systems, supply of rolling stock, and construction of stations.

- **Maintenance and operation:** Each of the physical components of the rail must be both maintained in good working order and operated on a day-to-day basis. These tasks can all be managed by a single entity, or may be undertaken by separate entities. For example, in Europe, the task of maintaining and operating the entire train system has historically been centralized in state-owned railways. More recently, however, European nations have separated the task of maintaining and operating the physical infrastructure of their rail systems from the task of operating train service, and are in the process of opening the latter task up to competition. (See "Beyond PPPs: Open Competition in European Rail Service," page 13.)

The Relationships

PPPs can be arrayed on a spectrum from those that are "more private"—that is, closer to the experience of full private ownership—to those that are "more public."

Private construction and ownership: At the most "private" end of the public-private spectrum are projects in which the role of the government is limited to providing regulatory oversight (or in some cases, financial subsidies) to private-sector builders of high-speed rail. Historically, this is how much of the U.S. railway network was built in the 19th century, with private-sector companies—sometimes benefitting from government subsidies or other forms of assistance—laying the tracks and providing service. In the United States, the DesertXpress high-speed rail line between Victorville, California, and Las Vegas has been proposed as an entirely privately owned and operated system, though it may benefit from government subsidies, including access to federal loans.[13]

Concessions: traffic-based: A concession is a grant of permission for a private firm to build and operate an asset—and collect revenues from that asset—for a fixed period of time and/or until other conditions in the contract have been met. In these agreements, concessionaires use the revenue stream from their operation of the facility or service to pay off debts incurred in the construction of the line and to pay for ongoing maintenance and operation of the system.[14]

There are many varieties of concession agreements, but for the purpose of evaluating high-speed rail PPPs, they fall into two categories: those in which the concessionaire's revenues are based on the usage of the line—which we'll call "traffic-based" concessions—and those in which they are not. "Traffic-based" concessions often take the form of build-operate-transfer (BOT) projects, in which a firm is granted a concession to build and operate a high-speed rail line, financing its investment with payments from riders, and then returning the project to the government when the concession expires.

In Taiwan, for example, the same firm that built the high-speed railway also operated revenue service on the line. But there are also traffic-based concessions in which the rail builder does not operate train service, but rather charges tolls—or "access fees"—to other companies that run train service on the line. An example of this arrangement is the Perpignan-Figueres rail line that links the rail systems of France and Spain. The line was commissioned by the national railways of France and Spain, operating as a joint venture, and was built by a consortium of private firms representing both nations. The concessionaire took

Beyond PPPs: Open Competition in European Rail Service

Public-private partnerships represent one way to tap the skills of private-sector firms in the provision of high-speed rail service. European nations, however, are taking the additional step of opening some aspects of rail service to market competition between existing state-owned railroads and/or private train operators. These developments have little relevance for the United States, which is just now building its high-speed rail network. However, they are often mentioned in discussions about rail "privatization" in the United States, and are therefore worth discussing.

Historically, Europe's railways have largely been built by state-owned firms, which also operated train service on those lines. Beginning in the early 1990s, however, the European Union issued a series of directives intended to change the way rail service was provided on the continent by mandating "open access" to rail lines. As opposed to the traditional arrangement in which state-owned firms could claim exclusive rights to run trains on their own tracks, the new system would operate more like the provision of intercity bus service over the highway network, in which any firm could provide train service, so long as it paid the appropriate access fees to the owner of the tracks and met other government standards.

The first result of this shift has been the separation of many former state-owned railways into distinct organizations devoted to providing rail infrastructure and operating rail service.

In some cases, as in France, this separation has resulted in the creation of separate companies. France created a new, state-owned infrastructure management company, French Rail Network (RFF), which is "responsible for capacity allocation, contracting, traffic management, and maintenance, although it subcontracts the traffic management and maintenance to the passenger rail operator, [SNCF]." [17] RFF owns all intercity rail infrastructure in France except stations, which are retained by SNCF.[18] RFF collects track access fees, which are approved by the Ministry for Transport, from SNCF and other rail operators who wish to use the network.[19]

In Germany, the infrastructure and rail operations functions are carried out by separate subsidiaries of the same firm, Deutsche Bahn (DB), a state-owned company. The company is divided into five large subsidiaries that handle track infrastructure, ticketing and sales, regional services, long-distance services, and freight.[20]

To date, open access has not resulted in a great deal of competition for high-speed rail service. For example, although DB's tracks have theoretically been open to competition since 1994, the company's inherent advantages have led to only a small amount of private competition, limited mainly to regional service.[21] In France, international high-speed rail service is currently provided by Eurostar and Thalys, which are consortia of which the state railway, SNCF is a major shareholder.[23]

There have been substantial political and technological barriers to broader international competition, but the European Union has been chipping away at those barriers for years, leading to the prospect of private firms competing with traditional state-owned firms—and state-owned firms competing with one another—to provide high-speed rail service to Europeans.

on financial risk in the venture in exchange for permission to operate the line's infrastructure for 53 years and charge tolls on every passenger and freight train that crosses the tracks at rates established in the concession agreement.[15]

Concessions: availability payments: The second major form of concession agreement relies on fees called "availability payments" to pay back the private investment in a high-speed rail line. Under an availability payment concession, the firm that builds the line is also responsible for its maintenance and operations over the length of the concession period. Rather than the private entity recouping its investment in the line through fares or other revenues, however, it receives regular "availability payments" from the government, contingent on meeting specified benchmarks for the availability of the line.

Some high-speed rail projects combine both kinds of concession agreements. The HSL-Zuid high-speed line in the Netherlands, for example, used separate consortia for the construction and operation of the rail system itself and the operation of the train service on the line. The concession for construction, maintenance and infrastructure operation was issued for a 25-year term, with the vendor scheduled to receive availability payments from the Dutch state, while a separate consortium won a concession to operate revenue service on the line.[16]

Public tender contracts: Public tender contracts are contracts for specific services for which vendors are paid specific sums. This is the traditional way in which private-sector entities have engaged in the construction of public infrastructure in the United States and is how most high-speed rail lines in the world have historically been built. In these arrangements, governments or state-owned railways retain overall responsibility for planning and operation of the system, but hire contractors for specific jobs—for example, the construction of a bridge or design and implementation of a signaling system.

The Pros and Cons of Public-Private Partnerships

Public-private partnerships are often touted as providing unique benefits above and beyond those that can be achieved through government action alone. At their best, PPPs merge the specific capabilities of public and private sector organizations. Additional benefits from using PPPs, however, are not always realized in practice—and poorly designed PPP arrangements can expose the public to an array of financial and public policy risks. Public officials considering PPPs must therefore evaluate specific proposals and vendors carefully to ensure that promised additional benefits are realized.

Potential Benefits of PPPs

Risk Sharing

One of the most important potential benefits of public-private partnerships is the ability to share the risk inherent in a major capital investment among a variety of public and private actors. High-speed rail lines are typically multi-billion dollar endeavors subject to a variety of risks—from unexpected difficulties building tunnels through mountains or densely packed urban areas to delays in the completion of adjoining transportation infrastructure. Sharing risks between government and private entities can—if done correctly—make it more palatable for both entities to "take the leap" in building a project with great benefits for society.

PPP agreements can share risk in a variety of ways:

- In a public tender contract, private contractors are held liable for building a piece of infrastructure—often at a particular price and on a particular schedule.
- In an availability payment (design-build-maintain) concession, private contractors are held accountable for quality workmanship by also being given responsibility for maintaining the line over a period of time.
- In a traffic-based concession agreement, private entities take on the risk

that ridership, and therefore revenue, on the high-speed rail line will be less than anticipated.

The potential for risk sharing is one of the primary selling points used by PPP proponents to encourage public-private partnerships—and is a particularly powerful selling point at a time of tight fiscal constraints. However, the ability of a PPP to shelter the government from risk depends on the details of the agreement. Evidence from abroad shows that even specific contract provisions designed to protect the government from risk may fail to do so because the fate of the project becomes inexorably tied to the fate of a particular private company—a problem known as "lock-in." (See page 17.)

Advantages in Speed, Cost or Quality

PPPs are often touted as being able to deliver infrastructure projects faster, cheaper or with better quality than a public-sector entity. This is not to say that private entities are inherently better suppliers of infrastructure than public agencies. Private entities bring many inherent disadvantages, including higher capital costs and the need to cover financial returns to shareholders. The process of undertaking a PPP also incurs transaction costs—such as the potential need to pay stipends to would-be bidders to help defray the cost of preparing proposals.[24] States and localities that have pursued toll road PPPs in the United States, for example, typically pay millions to auditing, consulting and legal firms.

A key question for government agencies considering PPPs is the degree to which the savings purportedly delivered by private companies are real or illusory. Real savings can result from a private company's access to expertise and experience, its ownership of proprietary technologies, or economies of scale. In the case of high-speed rail, there are several international firms that have amassed decades of experience in the construction and operation of high-speed rail lines, and may be effective competitors to build similar systems in the United States.

However, PPP savings can also be illusory if savings are merely generated by avoiding labor and wage requirements or regulatory standards that would otherwise govern projects built directly by government agencies. These changes might produce a nominal cost "savings" in the short run, but they are achieved by externalizing costs onto or transferring benefits from other residents and employees in the state rather than by adding unique value that can only be delivered by the private sector.

To assess whether a PPP approach delivers added value to taxpayers, governments must carry out a "value for money" test, such as the public sector comparator. These tests are intended to determine whether a PPP or traditional public-sector contracting will deliver the greatest value, taking into account quality, price and risk.

Access to Capital

Access to capital is not typically a strong suit of private entities. Government agencies are capable of borrowing large amounts of money to finance public infrastructure at relatively low cost. However, in the current atmosphere of constrained public budgets, access to private capital may make the difference between building necessary high-speed rail projects and leaving them on the drawing board for years to come.

Because of the multi-billion dollar price tag of most high-speed rail projects, governments in both Europe and the United States have stated that private investment will be necessary to build out their high-speed rail networks.

Potential Problems of PPPs

High and Volatile Capital Costs

Private companies have higher long-term borrowing costs than public entities. According to analysis by Dennis Enright at NW Financial Group, an investment bank, public sector costs in 2007 for raising capital through debt were a full 35 percent less than the lowest cost a private entity could hope to obtain.[25] Other academic studies confirm these consistently higher private capital costs.[26] And since the recession it has become relatively more expensive for the private sector to borrow capital compared with the public, with U.S. government debt remaining at near rock-bottom interest rates.

Because government officials can issue tax-free bonds and bond traders are willing to accept lower interest rates on public bonds, deals based on private capital are inherently more expensive than public financing. When investors purchase stocks or other forms of equity in private infrastructure companies, they take on greater risk than if they purchase private infrastructure bonds; therefore, they expect even higher rates of return. Thus, regardless of whether private companies raise capital through debt or equity, their costs will be higher than public financing.

Another key credit-related risk of PPPs is the possibility that the cost of credit will increase—or that credit will dry up entirely—midway through a project. A private entity's inability to obtain capital, or to obtain capital at the cost anticipated when the PPP was originally devised, can jeopardize the entity's ability to carry out the project—leaving the government responsible either for bailing out the private entity or taking over the project midstream. Such a situation occurred with the construction of Taiwan's high-speed rail line. (See page 21.)

Lopsided Allocation of Risk

Governments that engage in PPPs often do so in the hope of sharing the risks of a project with a private partner. However, the very nature of PPPs often leads to a lopsided allocation of risks that leaves the public sector on the hook when unexpected problems arise in a project.

Public and private entities come to PPPs with inherently different motivations: the government to deliver a given infrastructure project on time and with the lowest possible public outlay, and the private partner to maximize profit. The initial negotiation of the contract is the time at which the public sector has maximum leverage, with the ability to choose the best of a competing set of bids from private entities. Once a PPP bidder is chosen and a contract is signed, however, the balance of power shifts. The government entity remains accountable to the public for delivering the project on time, and becomes dependent on the private partner to meet that objective, giving the private partner leverage in subsequent renegotiations of the contract.

Once a project is initiated, the ultimate source of leverage for a private sector firm is the threat that the entity will go bankrupt or walk away from a project—leaving the governmental partner with an unfinished infrastructure project it may be ill-equipped to complete. Once a project is seen as moving forward, decision-makers will make budgetary and infrastructure plans under the assumption that the PPP will be completed, increasing the disruption and costs for the government side to exit the process. Poorly written PPP contracts may give private-sector partners other points of leverage: including the ability to slow down work or change the terms of delivery of the high-speed rail service. Even in cases where the language of a PPP contract may appear to be clear-cut, the mere threat of protracted litigation, arbitration or delays

may be enough to force concessions from the government.

This situation—known as "lock-in"[27]—is not dissimilar to the situation faced by the U.S. government during the financial crisis of 2008, in which the government faced the difficult choice of bailing out banks or allowing them to fail, risking the onset of a second Great Depression. When PPP projects become "too big to fail"—or when it is too difficult to replace an incumbent firm mid-project—then risks that the public sector thought it was avoiding may instead be magnified.

Lock-in is a particular problem with high-speed rail PPPs because renegotiation of contracts is so common. High-speed rail projects are incredibly complex, meaning that it is nearly impossible for contract writers to anticipate every possible condition that will arise over the course of the project. When circumstances change and contracts must be renegotiated, new opportunities emerge for private firms to exert leverage over their public sector partners.[28]

There are ways to reduce the threat of lock-in. One is to eschew PPPs for projects that are too big or too important to fail.[29] Another is to structure PPPs in such a way as to ensure that no individual vendor becomes indispensible to the project. In addition, PPP contracts can be written to require private-sector actors to post bonds guaranteeing completion of the project,[30] to purchase insurance or establish escrow accounts against certain risks, to create clear expectations for which parties are responsible for certain types of unanticipated changes (e.g. changes in applicable safety standards), and to establish clear processes for dispute resolution and contract renegotiation.

Monitoring and Complexity

PPP deals also create significant legal and monitoring costs for governments. Developing and implementing a PPP agreement requires the participation of an army of financial analysts, lawyers, and experts in infrastructure development. Even after a contract is signed and work begins on a project, expert consultants are needed throughout the contract term to interpret the contract and potentially litigate to ensure that the private operator is upholding the terms of the deal. These ongoing costs to government are rarely considered as part of the cost of a PPP project.

Coordination Issues

Successful high-speed rail services are more than just trains running on tracks. They are the confluence of many systems—from power supply and train control to ticketing and station operations—all working together seamlessly. In traditional state-owned railways, these systems were designed and operated under a single corporate roof. PPP-based project delivery plans, however, can include dozens of individual contracts for various pieces of the high-speed rail system. Failures of coordination among the various contract holders can result in unplanned costs or quality concerns. Ensuring that contractors coordinate their efforts can also add another monitoring and enforcement burden for the government agency initiating the PPP project.

In addition, because high-speed rail is generally built one line at a time, rather than as a completed network, new lines must be integrated seamlessly into the broader network. Dividing the ownership or operations of multiple lines within a network among different firms has the potential to impose new challenges in ensuring that the system works as a cohesive whole.

Loss of Control

A PPP arrangement involves a swapping of risk for control. In a traffic-based concession agreement (in which the private partner uses the revenue from high-speed

rail service to pay for the cost of building the line), the government theoretically sheds a great deal of risk, but also provides the private company with a greater deal of control over how a high-speed rail line is operated. This is because private entities are less willing to depend on revenues from ticket sales and other user fees to recoup their investment unless they feel protected against government actions that might curtail those revenues. Availability payment concessions (design-build-maintain) on the other hand continue to expose government to ridership risk, but also give the government greater control over how the high-speed rail line will operate.

The public faces dangers that a PPP may create a publicly subsidized piece of infrastructure that is primarily used to serve the profit-maximizing purposes of a private entity in ways that conflict with the public interest. The most obvious example of this tension arises in the setting of ticket prices. A private concession operator will tend to want higher-priced tickets as a way to maximize their revenue for shareholders, even if higher ticket prices depress total ridership and therefore diminish the positive public impact of the route.

The concessionaire for construction of England's High Speed 1 line was forced to charge above-market access fees to recoup its investment. The British government later took over the company, a move intended to expand the use of the line. Credit: Darnell Ibraham

A similar example occurred in the development of Great Britain's first high-speed rail line, High Speed 1, which was built by London & Continental Railways (LCR) under a concession agreement with the British government.[31] In an effort to maximize revenue and pay back its debts, LCR assessed track access charges to companies providing rail service on the line that were higher than commercial rates and were thought to be high enough to make it unprofitable for would-be competitors to offer service on the line.[32] Had the situation continued, the public interest imperatives of maximizing the use of the infrastructure would have run headlong into LCR's financial imperative to maximize revenue. As it turned out, the British government—which had already agreed to guarantee LCR's debt—took formal control of the company in 2009 and entered into a new PPP for operation of the line.[33] By taking full ownership over LCR, the British government made it possible to offer lower track access charges and gain greater use of the high-speed rail line, though at the cost of absorbing much of the risk it thought it had offloaded to LCR in the first place.

Delays at Front End of Project

PPPs often promise to complete construction faster than publicly built projects—in part because penalties for late delivery included in PPP contracts drive improved performance by contractors. The difference in speed, however, often depends on when one starts the clock. PPP projects are often more difficult to get off the ground than publicly built projects, especially if they are conducted with due diligence and proper input from stakeholders.

The first hurdle in building a project using PPPs is to design one that is attractive to private investors while also satisfying public interest objectives. This can be difficult. The Perpignan-Figueres high-speed rail line connecting France

and Spain—often considered a successful PPP—is one example. Preparation of the concession agreement began in 2000, with publication of the request for bids in July 2001. One year later, in July 2002, the bi-national agency responsible for building the line chose a preferred bidder, only to walk away from negotiations in early 2003, citing "unacceptable" conditions demanded by the private sector bidders.[34] The collapse of negotiations forced the contract to be opened for bid once again. The final contract was issued in early 2004 and financial close on the deal was not accomplished until February 2005.[35] The ability of the bi-national agency to hold firm during the first set of negotiations helped protect the public against an inadequate deal, but it also resulted in a significant delay in the start of the project.

Evaluating the Experience Abroad

Public-private partnerships have increasingly played an important role in the construction and operation of high-speed rail systems around the globe. What lessons can be learned from the experiences of other nations?

In this section, we review four case studies of PPP or privatization efforts abroad. Two of the case studies—in Taiwan and the Netherlands—are cautionary tales illustrating that the purported benefits of PPP arrangements, particularly the sharing of risk, are not always realized in practice. The case study from Britain looks beyond the realm of high-speed PPPs to examine the risks of infrastructure privatization more generally, specifically the conflict between profit-making and protection of the public interest inherent in privatization. Our fourth case study, from Portugal, describes how reliance on PPPs can reduce a government's ability to react to fiscal challenges, even if the PPP agreements themselves are designed to avoid the mistakes of the past.

Taiwan: Taxpayers Find Themselves on Hook for "Privately Built" High-Speed Rail Line

By many measures, Taiwan's high-speed rail line, which links the island nation from north to south, has been a success. Between 2006, the year prior to the launch of high-speed rail, and 2009, the number of passenger-miles traveled by train in Taiwan had increased by 56 percent, while the number of passengers on domestic air service had dropped by 53 percent.[36] By 2009, high ridership on its densely populated routes allowed the company that built the line to start turning an operating profit.[37]

Taiwanese taxpayers, however, are paying a higher price for that success than had been anticipated. Once promised that private capital would pay the entire cost of constructing the line, Taiwan taxpayers have instead been asked to pick up a significant part of the tab.

In 1998, the Taiwan High Speed Rail Corporation (THSRC) was awarded a 35-year concession to build and operate Taiwan High Speed Rail (THSR), partially based on THSRC's promise to build the

system without government capital. But the company began to run into difficulty after the Asian financial crisis in the late 1990s, when it was forced to take out loans with high interest rates in order to pay for the project.[38]

Like a homeowner saddled with an adjustable rate mortgage, the high-interest debt soon became financially unsustainable, with more than three-fifths of the company's net income used to pay off these loans.[39] As late as 2009, the company was still paying a high 8 percent interest rate on some of its loans.[40] In addition, the company was forced, as a result of its status as a concessionaire, to depreciate the value of its assets much faster than it would have under traditional forms of ownership, adding to the financial woes that caused the company to post annual losses that totaled $2.18 billion by 2009.[41]

Because of the ongoing financial losses, "THSRC shareholders signaled reluctance to invest further in the project, which has led to difficulty for THSRC in securing financing from banks as well," according to a report by the Utah Foundation.[42] A lack of financing led to problems with finishing the project, and when the network opened to the public in 2007, several key stations were incomplete.

In order to keep the system operating, the government refinanced THSRC's loans and contributed hundreds of millions of dollars to the network, even though the original build-operate-transfer plan stipulated that the THSRC build the system without any government capital. The government has opted not to take over the company, expressing no interest in growing its current 40 percent share or investing money beyond the bailout.[43]

The private-sector builder of Taiwan's high-speed rail line initially pledged to build the system with no public investment. An accumulation of high-cost debt, however, ultimately led to a government bailout. Credit: Yueh-Hua

However, to help "persuade creditors to issue loans to the THRSC at interest rates that will allow it to remain solvent," the THSRC has elected a new chairwoman, backed by the government, allowing "the government more of a supervisory role in the company."[44]

The Taiwan example illustrates several important challenges of PPPs. First, it demonstrates the dangers of overreliance on private capital. Like many homeowners saddled with high-interest debt during the subprime mortgage crisis, the THSRC was ultimately unable to restore itself to financial health, even when high-speed rail service began to turn an operating profit, due to its earlier legacy of high-interest bank borrowing. Financing the project publicly from the very start may have proven to be cheaper and more stable, reducing the crushing debt load the THSRC faced—and possibly reducing the burden of the bailout on the government of Taiwan, which ultimately refinanced the company's debts anyway.

Second, the Taiwan example demonstrates the dangers of "lock-in." The Taiwanese government could have allowed the THSRC to go bankrupt and operation of the high-speed rail line to cease when the company ran into financial trouble. Doing so, however, would have resulted in the abandonment of a critical public asset, leaving the government with little choice but to prop up the failed business plan of a private operator with public funds.

Netherlands: Poor Planning Meets Failure to Manage Risks

The construction of a high-speed rail line involves the mobilization of billions of dollars in capital and thousands of workers in a series of highly complex and interrelated tasks. The construction of the HSL-Zuid high-speed rail line—which links Amsterdam and Rotterdam in the Netherlands to Belgium—demonstrates the problems that can arise when the carefully choreographed set of actions needed to bring a high-speed rail PPP to successful completion goes awry.

At the time HSL-Zuid was commissioned, it was the largest PPP rail project in Europe. The innovative deal was praised in PPP circles, earning notice as the "European PPP Deal of the Year" in 2001 from *Project Finance* magazine, which extolled its "particularly appetizing risk profile."[45] Despite its high profile as a PPP, however, the HSL-Zuid project relied mostly on public funding, drawing on private investment for only 14 percent of the project cost.[46]

From the beginning, however, designers of the HSL-Zuid project made several important mistakes that led to cost overruns, delays and government bailouts. The first major mistake was in the structure of the deal itself. Construction of the high-speed line was broken into three separate projects:

- The job of building the "substructure" of the system—the tunnels, bridges, and concrete slabs on which the track rests—was divided into seven packages and given to civil contractors. The Dutch government judged that it would be unable to transfer risks to the private sector for substructure construction, and so awarded the substructure contracts according to traditional contracting principles.[47]

- The "superstructure" concession was given to the Infraspeed Consortium, which was responsible for designing, building, financing and maintaining the system's tracks, stations and signaling for a 25-year period.

- The operations concession was won by the High-Speed Alliance, a consortium 90 percent owned by the Dutch

state railway, NS, and 10 percent owned by Air France-KLM.

By dividing up the project in this way—and negotiating all three sets of contracts early in the process—the Dutch government wagered heavily on the ability of the winners of the contracts to communicate well with one another, and to complete each segment of the project on time.

Problems began to surface immediately. The bids for the substructure contracts were higher than expected, due largely to a lack of competition in the Dutch construction market. Dutch investigators later found that the consortia bidding on the substructure projects engaged in illegal coordination, though it is unknown how much this affected the final bids.[48] In any event, the total estimated cost of the project ballooned to 43 percent higher than budgeted.[49] Because the Dutch government was primarily concerned with completing the project within its pre-determined budget, the higher-than-expected bids forced the government to make cutbacks in the design of the system and to pursue other strategies to induce lower bids, including the elimination of penalties for late delivery of the substructure. This left the state liable for making payments to the superstructure and operations contractors in the event that the project was delayed.[50]

The shift in financial responsibility for delays was part of an overall pattern in which the state was left liable for project risks—defeating much of the purpose of the PPP arrangement.[51] Indeed, Dutch auditors found that the state took on almost all the responsibility for cost overruns in the original contract.[52] The cost control benefits of the PPP were also largely unrealized, as the project far exceeded its original budget, costing 55 percent more than originally projected.[53]

The cost overruns were due to a variety of factors, including changes in the scope of work and poor planning and coordination among the various contracts. The interface between the substructure and superstructure contracts proved to be a particular problem.[54] Infraspeed, the concessionaire for the superstructure, based its project bid on civil engineering designs that had changed during the bid assessment, resulting in incompatibilities in the design of various components.[55]

Fundamental problems also existed within the government bodies responsible for supervising the contracts. It was alleged that the contracts for the system were so complex as to be unintelligible to the government officials responsible for enforcing their terms.[56] In addition, two separate state agencies were responsible for overseeing the project, leading to problems determining who was in charge.

Finally, the new high-speed line was intended to operate on the emerging European automatic train control system, the specifications for which were not complete until late in the process. This resulted in a delay in the opening of the line, with interim service on the line finally launched in September 2009—roughly two years late—with maximum speeds of 99 mph. Full service at the maximum speed has yet to be launched, due to delays in the provision of the necessary trains.

These delays resulted in yet another problem: Due to the delays in obtaining trains, the franchise selected to run train operations, High Speed Alliance (HSA), was forced to start paying access charges—per its concession agreement—without being able to run train service, leaving it with no revenue from the line.[57] The Dutch government was forced to make two large payments to the company to keep it afloat, extended its concession, and waived access fees for a few years, to be paid back later with interest. Access charges were also reduced due to lower-than-anticipated train speeds and reduced frequencies.[58]

In short, the HSL-Zuid project, considered an exemplary PPP project at the

time the project was launched, wound up illustrating, in many ways, how *not* to structure a PPP for high-speed rail. The Dutch government's decision to undertake separate contracts for superstructure and substructure appears to have been a mistake. The lack of effective competition among bidders prevented anticipated cost savings from being realized, while the lack of proper risk management provisions in the contract exposed the state to effects of cost overruns. Failing to establish a clear line of authority for government management of the project, and creating what was in effect a public-public partnership for operation of the line compounded the problems.

Great Britain: Infrastructure Privatization Creates the Wrong Incentives

In Great Britain, the 1980s saw Prime Minister Margaret Thatcher lead a period of privatization of formerly nationalized industries. By 1993, under her successor, John Major, privatization had come to the nation's rail sector. The breakup of the former national rail company—British Rail (BR)– resulted in the creation of dozens of local and regional rail operating companies and separate companies responsible for specific tasks within the rail system. The for-profit company Railtrack was created to operate and maintain the infrastructure of the system: the tracks, signals and stations.

The experiment with for-profit management of the nation's rail infrastructure lasted less than a decade, with Railtrack ultimately being folded into Network Rail, a non-profit corporation operating under direct supervision of the British government.

Poorly drawn contracts and misaligned incentives led to Railtrack's lack of proper management and maintenance of the system infrastructure. First, in order to increase the "saleability" of the numerous maintenance companies created after the break-up of the old BR system, the government "decided to make Railtrack into a contract management operation in which essentially all infrastructure work (maintenance and rehabilitation) was carried out under contract," according to a report by the World Bank.[59] Railtrack had no ability to shape these contracts, however; the government established them in advance and packaged them with the maintenance companies to improve their marketability. Additionally, under this system, contractors—not Railtrack—held responsibility for deciding whether maintenance work on the track was needed.[60]

As a result, Railtrack was left without the in-house expertise needed to manage and supervise its contractors and to independently assure the system's safety.[61] The contracting system also resulted in Railtrack and its contractors bickering about who was responsible for fixing safety problems rather than taking prompt action to address them. According to one analysis of the British experience with rail privatization, "Each had incentives to pass the cost of dealing with the problem to each other, with the result that meetings were followed by letters and letters were followed by memos in a sort of caricature of the worst kind of bureaucratic buckpassing."[62]

Moreover, Railtrack was a victim of poorly designed incentives. In an attempt to strike a balance between what Railtrack would have to charge the train operating companies (TOCs) to cover its rail infrastructure costs and what the TOCs could afford to pay to maintain successful franchises, the government established an access charge regime with "mostly fixed annual charges for each franchise along with a relatively small variable charge for actual use," according to the World Bank.[63] This regime meant that Railtrack's revenues were disconnected from the amount of traffic the system carried. Increases in traffic were likely to *lose* money for Railtrack,

as the company would face increased maintenance expenses.[64] On the other hand, because access charges were low, TOCs had lots of incentive to run as many trains as they could, which dramatically increased both congestion and maintenance costs.[65]

Railtrack's problems came to a head in 2000 when a train derailment in the town of Hatfield killed four people and injured dozens. The Hatfield accident occurred when a rail fractured underneath a passenger train traveling at 114 mph.[66] Problems with the segment of rail that failed had been known to the contractor responsible for maintaining it for more than a year prior to the accident. Subsequent investigation also turned up a large backlog of needed maintenance on the rail system, as well as the failure of Railtrack to properly implement previous government recommendations to improve its management.[67]

In the wake of the Hatfield disaster, Railtrack ordered a series of speed restrictions and emergency repairs and inspections that wreaked havoc with train service and reliability. More than 165,000 scheduled trips were canceled during 2001, three times the number of the year before.[68] On-time performance collapsed, and the company never recovered from the loss of confidence by passengers and the British government.

The privatization of Railtrack was not the type of arrangement typically conceived for rail PPPs, nor did it deal with high-speed rail, but it does illustrate several important principles about the structure of PPPs. First, it demonstrates that it is critical in any contracting arrangement—such as that between Railtrack and its maintenance subcontractors—that the supervising entity have the technical ability to ensure that contractors are performing their jobs adequately, especially when public safety is at stake. The same principle applies to state agencies responsible for supervising the work of contractors in a PPP. Second, it shows that the structure of incentives matters greatly because private entities must be induced to make business decisions that benefit the public interest. The financial incentives experienced by Railtrack—a publicly traded company—clearly did not align with the public interest. Even the former head of Railtrack, Gerald Corbett, acknowledged in an interview with the BBC that "there is a tension between shareholder interests and public service obligations. The only way we can make profits is by not doing the things we should do to make the railways better."[69]

Portugal: Will PPPs Leave the Public Holding the Bag Amid a Fiscal Crisis?

Portugal is situated next to one of the world's high-speed rail leaders, Spain. Yet, nearly two decades after the completion of Spain's first high-speed rail line in 1992, Portugal remains without high-speed rail service.

Over the past decade, Portugal has developed a plan to build a high-speed rail line, which would link its major cities with the Spanish network. In developing its approach to the project, Portugal consciously sought to avoid many of the pitfalls of earlier rail PPPs. However, with the nation in financial crisis, Portugal may wind up saddled with liabilities to private partners, but with little else to show for its high-speed rail efforts.

Portugal assigned responsibility for planning and construction of the high-speed rail network to a company specifically created for the purpose, called RAVE, which was co-owned by the government and the Portuguese state railway.[70] RAVE (which was recently dismantled in the wake of the country's financial crisis) was established in 2000 and spent years devising the physical plan for the system, concluding preliminary studies and environmental reviews, and developing the

Portugal is seeking to build a high-speed rail line that will link with the extensive high-speed rail system built by neighboring Spain (above, a Spanish train passes by a castle in Córdoba). However, Portugal's high-speed rail ambitions may be derailed by the country's financial crisis, potentially leaving the nation liable for paying compensation to its private partners. Credit: Renfe Operadora, Dirección de Comunicación, Marca y Publicidad

business plan for high-speed rail prior to the system being put out to bid.[71] The years of study and advance preparation were believed to be critical to reducing the number of uncertainties in advance of the bidding—creating more confidence in private investors to enter bids and compete with one another on price.

In determining how to divide up PPP projects, nations face competing imperatives—dividing the project into too few (and too large) pieces reduces the number of companies capable of competing for the business, stifling competition and adding to the risk of "lock-in." Dividing the project into too many pieces, on the other hand, increases the number of interfaces among different sections of the rail line, leading to potential problems with coordination.

RAVE ultimately opted to break its high-speed rail construction program into six separate PPP projects, five of which are projects to build complete sections of the high-speed rail line, with one national contract for signaling and communications over the entire network.[72] According to an analysis by the accounting firm KPMG, RAVE conducted an analysis to ensure that "six PPP projects would represent an optimum balance between generating private-sector interest while minimizing the number of interfaces between projects and contractors."[73]

The business plan paid a great deal of attention to the structuring of incentives to ensure that they align with public interest imperatives. For example:

- The builders of each section of rail were to be paid back over the 40-year period of the concession through availability fees, which places the

incentive on the companies to do high-quality construction and to maintain the availability of the tracks over a long period of time. In addition, about 2 percent of the compensation was to be tied to the amount of traffic carried on the line, providing the infrastructure company with an incentive to work closely with the company operating rail service to maximize traffic.[74]

- In the agreement for the first section of high-speed rail—the Poceirão-Caia segment—major project-related risks and hurdles were clearly identified and consciously split between RAVE and the private partners. For example, the risk of changing technical specifications was addressed by adopting broad guidelines in the concession agreement with a determination of final specifications at a later date.[75] The state, meanwhile, took on responsibility for purchasing the rolling stock, which will be transferred to the operating company once it is chosen.[76]

Portuguese officials claim that their advance preparation, clear division of risks, and decisions on how to divide the project will result in major cost savings. Using the public sector comparator test (see page 31), RAVE claims that the PPP will cost 40 percent less than it would have if built by the public sector, and notes that the cost of the project decreased over the course of planning and bidding, rather than going up. If completed as planned, the system would be one of the least expensive in the world.[77]

However, the PPP approach still left the Portuguese government on the hook for a major share of the project's costs and risks. The state was forced to compromise on several contract conditions in order to satisfy bank lenders and took on itself the risk posed by interest rate fluctuation—a step believed to be necessary to finance the project during the global financial crisis, but one that assumes a risk usually borne by private-sector actors.[78] In addition, the line will be built with heavy public investment, with 55 percent of the project cost borne by the Portuguese state and the European Union.[79] The public sector outside of Portugal is also expected to take on some financial risk in the form of substantial loans from the European Investment Bank to the private-sector companies building the lines.[80]

One risk that apparently was not fully considered, however, was the risk that Portugal would have to pull back on its commitment to the project as a result of the nation's growing financial crisis. Yet, under conditions imposed by a recent International Monetary Fund-European Union bailout, new PPP projects—including for high-speed rail—are to be suspended. In addition, the nation's existing PPPs—which Portugal had relied heavily on to build public infrastructure projects—are to be investigated to find out whether they are concealing additional public debt.[81] The country has also been instructed to look for opportunities to renegotiate existing PPPs.[82]

As of this writing, Portugal's high-speed rail program is in limbo, its fate to be determined by its new government, elected in June. But Portugal's decision to move forward with a PPP approach could cost the nation dearly if it decides to halt its high-speed rail plans. Private-sector vendors are already beginning to clamor for compensation from the Portuguese government that could total in the tens or hundreds of millions of Euros.[83] In addition, a pullback from the project would threaten relations with Spain, which is extending its high-speed rail network to the Portuguese border as part of a bilateral project to link the two nations' capital cities.

The Portuguese experience illustrates several potential pitfalls of PPPs. First,

PPPs used for infrastructure investments in other areas of the economy may have given the Portuguese government a mechanism to run up public debt without accountability (see page 30), helping to contribute to the nation's crushing debt load. Second, Portugal's use of PPPs is currently reducing its flexibility in responding to the financial crisis, as the nation risks having to pay compensation to private-sector partners in the event of the cancellation or slowdown of its high-speed rail plans. Third, Portugal's experience illustrates that even the most thoughtful and well-structured PPPs still expose governments to a hefty share of project costs and risks.

Protecting the Public Interest: Principles for High-Speed Rail PPPs

Public-private partnerships can be useful tools for governments to undertake large infrastructure projects in ways that reduce cost and increase reliability. However, PPPs can also be structured in ways that impose large risks on government and taxpayers, waste money, and create incentives that run counter to the public interest.

In previous papers,[84] the authors have laid out general principles for the use of privatization and PPPs in toll roads and other public assets. The principles that should guide the use of PPPs in high-speed rail are quite similar in some ways, but differ in important respects.

1: Governments Must Only Pursue PPPs for the "Right" Reasons

The first rule for entering into any productive partnership is that you need to know what you want to get out of it. Governments should enter into PPPs only with a clear idea of the benefits they hope to achieve.

There are good reasons and bad reasons to enter into a PPP. As noted earlier, PPP proponents suggest that partnerships provide the opportunity to cut costs, reduce public-sector risks, and improve quality and timeliness in the delivery of major infrastructure projects. Regardless of whether these claims are credible in a particular case, PPP arrangements may also be undertaken for other reasons, including:

- The ability to evade labor or other regulations that pertain to government-sponsored construction projects by instead placing the project under the responsibility of a private actor.

- The ability to shift the costs of an infrastructure investment "off balance sheet," thereby masking the degree of public investment in a project and potentially encouraging the public sector to take on projects that would otherwise fail to pass political muster or to accumulate large amounts of hidden debt.[85]

- The ability to pass off politically unpopular decisions to an unaccountable private entity, as has happened with toll increases and parking rate increases in the wake of previous privatization episodes in the United States.

When governments consider PPPs, the public not only deserves the right to scrutinize those arrangements, but also to understand the government's rationale in pursuing them. Understanding the reasons for pursuing a PPP will also help ensure that the eventual agreement serves those purposes.

2: PPPs Must Deliver Identifiable Added Value

Pursuing a project through the use of PPPs creates a set of risks for the public sector and results in the sacrifice of some degree of control over the project. As a result, PPPs should only be pursued when they deliver added value for taxpayers.

To determine whether a PPP project will deliver added value, governments should undertake comprehensive and evenhanded financial analyses that compare the costs of the project under a PPP versus traditional public procurement. In addition, they must be willing to walk away from PPPs as a procurement mechanism if the test shows that the hoped-for savings will not materialize.

Many countries subject PPP projects to a test called the public sector comparator (PSC). The PSC test has been the subject of criticism given the potential for small changes in the cost assumptions, the factors considered, and assumptions about the value of money over time to dramatically affect the results. In 2002, the assistant auditor general at Britain's National Accounting Office went so far as to label the test as applied in that country "pseudo-scientific mumbo jumbo."[86] The potential for manipulation of the test is particularly great when the government has already committed itself to a PPP approach, or when the test comes to be seen as a hurdle to be surmounted, rather than as a real tool for evaluating whether a PPP for a particular project makes sense.

In other words, while completing a value-for-money test should be a prerequisite for moving forward with a PPP project, it is also necessary that the test be fair and comprehensive, that it be carried out by an agency or organization with no vested interest in the outcome, and that the analysis include examining how adjustments in sensitive assumptions would affect results.

3. PPP Contracts Must Align Private Sector Incentives with Public Sector Goals

The previous experiences of high-speed rail PPPs in the Netherlands and Taiwan—and with rail privatization in Britain—demonstrate that PPP agreements must be structured in ways that reward private sector partners for actions that benefit the public interest rather than merely assuming a confluence of interests. Contracts should instead seek to anticipate ways that interests will diverge and take particular care to leverage pro-public action, and to spell out obligations and dispute resolution procedures for those instances.

Recently, the availability payment—or design-build-maintain—model has gained favor both because it removes ridership risk from the private sector, making the projects less risky to finance, and because it exposes the private sector actor to the consequences of the decisions it makes

during construction. A poorly or cheaply built rail line, it is believed, will cost more to maintain over time and be out of commission more often. By basing compensation on availability payments and requiring private sector operators to take on the costs of maintaining the system they have built for a particular period of time, well-aligned incentives for quality construction are put in place from the very beginning. The success of this approach, however, depends on the ability of government agencies to monitor contract performance, to enforce contract provisions, to prove that any shortcomings are the fault of the operator, and, if necessary, to replace vendors that consistently fail to meet performance standards.

In general, all PPPs should have detailed, clear, complete and rigorous standards that govern contractor performance, with clear criteria for measuring success and failure, regular evaluation of performance, financial consequences for failing to meet the designated standards, and clear processes for dispute resolution.

4. PPPs Must Only Be Pursued in an Atmosphere of Competition

Private sector participation in government infrastructure projects is only likely to be beneficial in cutting costs, improving quality, and mitigating risk if private sector firms are forced to compete against one another for the projects. It is also likely to be beneficial only to the extent that the projects do not become "too big to fail" and the state does not become locked into partnerships with particular private entities.

PPP projects must be structured in such a way as to attract multiple competitive bids. In Portugal, for example, the signaling and communications contract was bid out on a national—rather than regional—basis in part based on the assumption that there were a limited number of global firms willing and able to bid for the contract. In the Netherlands, the process of bidding out the substructure contracts *appeared* to be competitive, with various consortia ultimately winning the contracts. Unfortunately, those consortia were largely made up of different configurations of the same few companies, which pursued anticompetitive practices during the bidding process.[87]

Breaking high-speed rail projects into smaller pieces to enable a variety of firms to compete is not without drawbacks, since doing so creates additional interfaces requiring coordination among various actors. However, it does reduce the chances that the state will be "locked in" with a single contractor on a project that is "too big to fail," and increases the chances that competition among firms will result in lower prices and better quality.

5. PPPs Must Only Be Pursued by Capable and Prepared Governments

The experience with PPPs abroad suggests that governments that enter PPPs ill-prepared and without the in-house expertise to understand contracts and monitor contractor performance are likely to make major mistakes—mistakes that have important ramifications for the public interest.

Governments need to evaluate honestly their capacity to assess and monitor concession agreements to determine whether they can adequately protect their constituents. In addition, governments should take the time to develop clear and specific plans for their high-speed rail networks, conduct preliminary studies (including, where possible, environmental reviews), develop

well thought-through business plans, and come to a clear vision of their goals for the project *before* making a final decision as to the type of contracting model they will use to build the system, much less solicit bids. This process takes time, but it is necessary in order to solicit high-quality bids and build private-sector confidence in the capability of the government to understand and manage the project.

The substantial expertise needed to protect the public interest in a high-speed rail PPP means that government agencies considering the PPP approach will be called upon to make major investments in human resources. While there is a role for hiring consultants to aid in this process, governments should be prepared to build the in-house expertise in law, finance, engineering and other disciplines needed to manage a PPP project.

The issue of human resources in the management of high-speed rail is already emerging in the United States. A recent report by the California Legislative Analyst's Office suggested that the California High-Speed Rail Authority may be insufficiently staffed to monitor and enforce the many contracts that are, or soon will be, under its authority.[88]

The private sector companies that engage in PPPs have experts to represent their interests in these areas; the public should be well represented as well.

6. There Must Be Clear Accountability in PPP Projects

The experience of the Netherlands, in which no government agency had clear responsibility for the execution of the high-speed rail project, shows that there must be clear lines of accountability in the execution of PPP projects. This is important not only to minimize "buck-passing" among contractors and government agencies, but also to provide a clear face for public accountability in the management of the project.

Establishing true accountability for long-term infrastructure projects is always a challenge, since it is rare that the same public officials responsible for authorizing and designing a project are still around to officiate at the ribbon-cutting. But while individual accountability is hard to maintain, institutional accountability is not. Ideally, the job of representing the public interest in the construction of high-speed rail should be clearly assigned to *one* entity responsible for carrying the project from start to finish.

7. The Public Must Retain Control over Key Transportation-System Decisions

When governments invest hundreds of millions to billions of dollars in high-speed rail projects—as they generally do regardless of whether a project is built by the government or under a PPP—they should be able to deliver infrastructure that serves the public interest. Yet, in cases such as that in Taiwan, or along Britain's High Speed 1 line (see page 19), the profit motive of private sector infrastructure operators has threatened to limit the usefulness of a high-speed rail line to the public.

Government has a right—and indeed a responsibility—to safeguard the public interest in the operation of high-speed rail lines, regardless of the structure of ownership. This principle has two important implications. First, it implies that concession agreements that give private sector actors untrammeled ability

to establish access charges or prices are almost always best avoided. PPP agreements should be structured in ways that encourage more—not less—ridership on a high-speed rail line.

Second, it suggests that the public sector must retain a strong hand in setting policies for the operation of high-speed rail service. In well-developed rail markets, open competition between carriers on the same tracks may eventually prove to be a workable model for providing rail service. Until then, however, the government should ensure that the high-speed rail asset is managed—through concession agreements, regulation, or both—in such a way as to provide the greatest possible benefit to the public interest, not just the greatest possible profit to the rail service or infrastructure operator.

8. PPP Contracts Must Not Impose Unreasonable Limitations on Future Government Action

Previous agreements in the United States to privatize toll roads and other public assets have often come with non-compete clauses or compensation event contingencies that prevent public entities from pursuing the best policies for the public interest. For example, the private lessee of a toll road might insist that the government not build a competing highway that would reduce their revenue.

Non-compete clauses are likely to be less of an issue with high-speed rail PPPs, except in the case of concession agreements in which the private actor's profit depends primarily on ridership levels. For instance, a PPP partner might claim that a government-sponsored rideshare program along the same corridor or improved commuter rail along some segments reduces its revenues. That may be true, but these are indirect risks that the public sector should take on. It is reasonable to stipulate against direct future claims on PPP revenue, such as from future ticket fees or rail operator taxes; but otherwise the public sector should be left free to make the proper public policy decisions without worrying about lawsuits and paying additional costs from indirect "harms" to a private partner.

9. PPP Contracts Should Be of Reasonable Length

Another issue that has arisen in asset privatization schemes in the United States is the establishment of contract lengths for asset leases of as long as 99 years, essentially transferring ownership of the facility to the private sector. Excessively long contracts create two problems: they can lock the public into a bad deal essentially forever, and they rely on contract-writers to anticipate all of the challenges that could occur up to a century in advance—an impossible feat. With the exception of the 90-year concession for Britain's High-Speed 1 line (which subsequently became moot after the British government took over the concessionaire and reissued the concession with a 30-year lease), most high-speed rail concessions around the world have been of lengths ranging from 15 to 50 years. Generally speaking, availability payment (design-build-maintain) contracts should be of sufficient length to motivate the builder to ensure high-quality construction—recent PPPs have been in the neighborhood of 40 to 50 years. Contracts for items that have a shorter life span or are more likely to be replaced soon—such as rolling stock and communications systems—should be shorter.

10. PPPs Must Be Subject to Extraordinary Transparency

Transparency is a critical component to the completion of PPP deals that benefit the public interest. Open publication of bid packages and other documents can enable the public and experts to identify problems in proposed PPP agreements before government officials sign on the dotted line. Transparency also reduces the potential for favoritism and backroom deals in the selection of contractors, ensuring that the contractors chosen are those who provide the best value for the money. In addition, transparency enables the public to play a watchdogging role in the oversight of project cost and to create an outside source of pressure on public officials and contractors to fulfill their responsibilities.

In addition to ensuring the transparency of dealings between the public sector and the lead contractor in a PPP deal, the government should also insist on monitoring the flow of public dollars to subcontractors, as well as ensure that subcontractors deliver the promised level of service to the public.

Inevitably, as in any business setting, some details of PPP negotiations will need to remain confidential on a temporary basis. However, the strong presumption should be that all documents produced in the course of a PPP process will be made available to the public as quickly as possible, and government agencies managing PPP processes must be accountable under public records laws.

When Do PPPs Make Sense?

Governments often look at the private sector as a knight riding to the rescue of infrastructure projects that are imperiled by political or budgetary constraints. However, ***the involvement of the private sector is not sufficient to turn a bad project into a good one***.

Moreover, ***effective high-speed rail PPPs can only result from the active and intelligent involvement—including the financial commitment—of government entities***.

Government entities considering high-speed rail PPPs must take several important steps in order to ensure the productive involvement of private-sector companies:

- Governments should be prepared to undertake extensive early planning and environmental review of a project before submitting it to bid, in order to reduce project uncertainties and increase the comfort of private actors in submitting competitive bids.

- Governments should be prepared to reduce the risk of cancellation of a project mid-stream by providing full-funding grant agreements that provide a multi-year commitment of government funds.

- Governments should acknowledge that public investment is necessary for the completion of a high-speed rail project and understand that even "private" rail proposals are likely to impose public costs, particularly in the event of a threatened private-sector default.

Are PPPs Really Worth It?

The debate over public-private partnerships often gets swept up in broader ideological debates about the proper role of government. To some conservatives, the private sector is often considered more efficient and more capable *by definition*. To some liberals, private sector involvement in

public works is inherently suspect.

With high-speed rail, the experience of public-private partnerships abroad suggests that PPPs are neither beneficial nor detrimental by their very nature. If a government agency seeking to launch an infrastructure project is sure in its goals, well prepared and strategic—and if it is fortunate enough to enter a market brimming with competent, competitive firms eager to win their business—a public-private partnership can be an effective way to get the job done. But the many problems and pitfalls with PPPs around the globe teach us that there are certain public interest protections that should never be negotiated away, and that the public sector must be an aggressive and capable defender of the interests of citizens in any PPP negotiation.

Critically, they also tell us that the most powerful tool available to the public sector in ensuring that PPPs serve the public interest is the ability to walk away. Governments should never commit to a PPP approach unless they are convinced that a PPP is the best way to achieve the goals of a particular project—and that a PPP can be achieved that comports with the above principles.

As the nation prepares to make a massive investment in our future in the form of high-speed rail, it is important that government officials recognize that public-private partnerships are not panaceas, but are merely useful tools that should only be pursued under the right conditions and with the proper protections for the public interest.

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