The Role of Private Investment in Meeting U.S. Transportation Infrastructure Needs

- **What We've Learned from Two Decades' Experience with Transportation Public-Private Partnerships (P3s) in the United States**

- **Recommendations for Increasing Private Investment in Transportation Projects Going Forward**

By William Reinhardt, 23-year P3 observer, publisher and editor of "Public Works Financing" newsletter

American Road & Transportation Builders Association
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Supporting Research, Education & Public Awareness

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About the Foundation

The American Road & Transportation Builders Association Transportation Development Foundation (ARTBA-TDF) was established in 1985 as a 501(c)3 tax-exempt entity to support research, education and public awareness projects and activities.

The Foundation supports an array of initiatives, including educational scholarships, executive education and awards programs, economic and research reports, a national exhibition on transportation at the Smithsonian Institution in Washington, D.C., and a facility dedicated to improving safety in roadway construction zones. Corporate and personal contributions to support the activities of the Foundation may be tax-deductible. The Foundation's Federal Tax Identification Number is 52-6283894.

About the Author

This special report was developed and written by internationally respected journalist William Reinhardt. As editor and publisher of *Public Works Financing* newsletter since 1988, Mr. Reinhardt has been uniquely positioned to observe and report on the nascent development and implementation of transportation-based public-private partnerships in the United States over the past two decades.

His authoritative publication is read monthly in 15 countries by 3,600 senior executives in the infrastructure project development/construction, finance and facility operations markets. About 85 percent of its readers are in North America; 35 percent are affiliated with the public sector or universities and 65 percent are in the private sector. Among its services, PWF maintains a global database of all major public-private partnership infrastructure projects and participants since 1985. PWF also produces annual league tables ranking the world's top transport and water project developers. Information about these services is available at pwfinance.net

Prior to starting *Public Works Financing*, Mr. Reinhardt worked as a senior editor at McGraw-Hill's *Engineering News-Record* (ENR) magazine in New York City. He is based in Westfield, New Jersey, and can be reached at 908-654-6572, or via e-mail at PWFinance@aol.com

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Introduction

It has been 22 years since what's been called the first major "public-private partnership" (P3) transportation project in the United States began construction. In July 1989, work began on phase one of today's 46-mile, limited-access E-470 Tollway east of Denver. The $323 million "design-build" contract was unique in that it did not rely on funds from either the State of Colorado or the federal government and included private sector sponsors who assumed significant financial risk on the project.

It was also in November of 1989 that the American Road & Transportation Builders Association (ARTBA) organized and conducted the first of its 22 consecutive annual conferences on public-private partnerships in transportation. This well-respected event brings together advocates and practitioners from around the world to network, learn and discuss policy issues in this specialized area of project finance, procurement and delivery.

In September 1990, the ARTBA Board of Directors voted unanimously to authorize the formation of a Public-Private Partnerships Division as part of the association's membership structure. The division's mission since its inception has been two-fold.

First, to develop and help the association move legislative and regulatory recommendations that will help advance P3s in the marketplace as a means to augment, or supplement, traditional public financing mechanisms. And the second, to help educate the association's members, public-sector officials, legislators and the public-at-large about the value of public-private partnerships in transportation.

With the U.S. Congress now developing legislation to reauthorize the federal highway and transit programs, ARTBA believed it was an ideal time to take an objective look at where the P3 market stands today after almost two decades of active promotion and assistance at the federal level.

This is particularly important as leaders from both political parties increasingly suggest that private investment must take on a much larger role in replacing public funding for needed transportation projects now and in the years ahead. For example, for the past half-dozen years, many advocates of P3s have claimed that anywhere from "$100 billion to $400 billion in private investment" is available for such use.

The objective of this paper is two-fold:

- First, to report on how transportation P3s have been utilized over the past 22 years and what impact P3 projects have had toward meeting U.S. transportation capital infrastructure needs; and

- Second, based on nearly two-decades of promotion and experience, to realistically assess the public-private partnership process in the U.S., including the political, procedural and financial constraints/opportunities for transportation investment through P3s.

The paper was commissioned by the ARTBA Transportation Development Foundation (ARTBA-TDF) and the association's "Transportation Makes America Work!" public affairs campaign as a fact-finding mission by journalist William Reinhardt, publisher and editor of the respected "Public Works Financing" newsletter since 1988. Many industry experts were consulted by Mr. Reinhardt for this paper, but all views and recommendations expressed are his, or, in the appendix, those of contributing authors.

The author also thanks David P. Reinhardt for his editorial assistance.

Executive Summary

Over the past 22 years, the Congress and the federal government have proactively supported development and implementation of public-private partnerships to finance and build transportation projects in many significant ways. These include:

- A statutory framework that allows the use of federal funds on P3 projects;
- Two pilot programs. The first, from the 1998 federal surface transportation authorization law, the "Transportation Equity Act for the 21st Century" (TEA-21), permits toll finance to reconstruct three existing Interstates. The second, from the 2005 law, the "Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users" (SAFETEA-LU), permits toll finance to pay for three new Interstates;
- Encouraging the establishment of state infrastructure banks (SIBs);
- Providing substantive assistance from the Federal Highway Administration's (FHWA) Office of Innovative Program Delivery;
- FHWA's "Special Experimental Project"(SEP-15) program to promote new P3 approaches to project delivery;
- Private activity bonds (PABs); and the
- The "Transportation Infrastructure Finance & Innovation Act" (TIFIA) federal credit assistance program.

Since 1989:

Using a broad definition that includes design-build as P3 projects, the data show:

- 24 states and the District of Columbia have used a P3 process to help finance and build at least 96 transportation projects worth a total $54.3 billion. The implementing states include: Alaska, Alabama, Arizona, California, Colorado, Florida, Illinois, Indiana, Maryland, Massachusetts, Minnesota, Missouri, Nevada, New Jersey, New Mexico, New York, North Carolina, Oregon, Rhode Island, South Carolina, Texas, Utah, Virginia and Washington.
    - Sixty-five percent of these projects occurred in just eight states—Florida (10), California (11), Texas (18), Colorado (9), Virginia (7), Minnesota (2), North Carolina (2), and South Carolina (3).
    - One-third of these project starts occurred in one of four years—2009 (10), 2002 (8), 1998 (8) and 2000 (7).
- 26 states have not initiated a P3 transportation project. These include: Arkansas, Connecticut, Delaware, Georgia, Hawaii, Idaho, Iowa, Kansas, Kentucky, Louisiana, Maine, Michigan, Mississippi,

Montana, Nebraska, New Hampshire, North Dakota, Ohio, Oklahoma, Pennsylvania, South Dakota, Tennessee, Vermont, West Virginia, Wisconsin and Wyoming.

- Over the past 10 years, 2001 through 2010, on average, five states started a transportation P3 project each year.

- Of the $54.3 billion in transportation P3 contracts let over the past 22 years, almost 75 percent of the contract value is accounted for by eight states—Texas ($9.57 billion, 17.6 percent), California ($6.02 billion, 11.1 percent), Florida ($5.63 billion, 10.4 percent), Colorado ($4.85 billion, 9 percent), Indiana ($3.85 billion, 7.1 percent), Virginia ($3.88 billion, 7.1 percent), Utah ($3.66 billion, 6.7 percent), and New Jersey ($3.35 billion, 6.2 percent).

- 79 of the transportation P3 projects, worth $31.5 billion, have been either Design-Build (DB), Design-Build-Finance (DBF), or Design-Build-Operate-Maintain (DBOM) contracts.

- 11 of the transportation P3 projects, worth $12.4 billion, have included a P3 financing component, been Design-Build-Finance-Operate-Maintain (DBFOM) contracts, or straight concessions involving traffic forecasting risk.

- Over the period, there have been four transportation asset privatizations with total up-front payments to government valued at $6.9 billion. These include the:

    - Indiana Toll Road (Indiana Finance Authority) in 2006—a 75-year lease for $3.85 billion;

    - Chicago Skyway (City of Chicago) in 2005—a 99-year lease for $1.83 billion;

    - Pocahontas Parkway (Virginia Department of Transportation) in 2006—a 99-year lease for $611 million; and the

    - Northwest Parkway (Colorado, Northwest Parkway Authority) in 2007—a 99-year lease for $603 million.

- The P3 market share of total U.S. capital investment in highways by all levels of government since 2008 is about 2 percent.

- A number of large P3 contracts have been signed since 2008 and, together, these account for about 11 percent of total national capital investment in new highway capacity in 2011. These new projects are mostly express lanes that can be tolled, built next to existing freeways in heavily congested urban areas.

Going Forward…

Many states have adopted alternative delivery contracting approaches that capture some of the benefits of P3s but do not entail private finance. As the data show, there is room for substantial growth in the development of new capacity through privately financed concessions.

However, given (a) the nation's enormous, unmet transportation infrastructure needs, (b) almost two-decades of proactive federal policy and legislative advocacy for implementation of P3 transportation projects, (c) the financial challenges facing all levels of government, and (d) the claimed "$100 billion to $400 billion in private funds available for P3 projects," several questions must be asked at this juncture:

- Why have there been so relatively few privately financed P3 transportation projects in the United States over the last 22 years? Why haven't there been many more?

- Why have only five states—California, Florida, Georgia, Texas and Virginia—developed the capability to execute complex P3 transactions involving private finance?

- What is a realistic forecast for P3 projects in the future?

Obviously, there are some impediments to widespread use of P3 approaches for meeting transportation infrastructure needs.

Experience is showing, for example, that P3s are likely not feasible replacements for the 80-90 percent of total public capital investment each year that is directed to transportation infrastructure repair, rehabilitation and reconstruction.

Potential investors are also not looking to participate in smaller, less expensive new construction projects or routine maintenance where governments and their traditional contracting partners deliver a high level of service.

It is also true that most of the profitable toll road corridors in America have already been developed and are being operated by independent toll authorities or states.

Tolling the Interstate system in order to pay for its reconstruction has been proposed as a major new business opportunity for P3 developers. But the political barriers to tolling in general and to tolling existing freeways in specific are formidable, especially among states.

It has become clear that the following reasons go a long way toward explaining why the P3 share of the overall U.S. transportation infrastructure construction market has been fairly limited over the past two decades and will likely remain so in the decades ahead:

- **P3s do not provide "new" or "free" money for building transportation projects.**

  Public sector investment in transportation projects and infrastructure is made in the public interest as a core function of government. The investment is funded through government-levied taxes and user fees, or through public borrowing—debt which must be repaid with interest with public funds generated by future tax or fee collections.

  The private sector must meet the same public interest test and also find projects that provide an adequate return on investment—a profit.

  P3s do not provide project funding, they provide project financing—borrowed money that must be reimbursed, at a profit, to the lender. Therefore, P3 projects must include a reliable revenue stream, which, as has been demonstrated over the past two decades' experience, is generally accomplished through tolling.

  While technology has made toll collection far more efficient and opened the door to "variable pricing" of infrastructure use based on demand, the fact remains that the decision whether or not to allow the collection of tolls from the public is a decision that must be made by elected officials. And the decision to initiate tolls—or increase existing toll rates—is no less a political decision than whether or not to raise

the motor fuels excise to pay for transportation infrastructure. As is the case with the gas tax, many risk averse politicians are not interested in having to make a decision to levy tolls.

Ultimately, public-purpose infrastructure must be paid for by some combination of users and taxpayers. Innovative financing models can access new sources of borrowing and allow leveraging of public funds. But they don't create new funding sources per se.

P3s are a financing solution chasing a funding problem.

- **U.S. tax policy is a hurdle for P3s.**

  The U.S. public finance industry very efficiently employs long-dated, tax-exempt debt to meet a large part of the capital-raising needs of governments and non-profit authorities. When compared to the interest rates on the taxable debt used in P3s, there is a cost-of-capital advantage of 1% to 2% conferred on state and local borrowers by federal tax rules. Some of that advantage can be offset when P3s access special federal financing instruments that help to level the playing field.

  To compete with the low cost of public borrowing, P3 projects as a class must be tightly managed to control expenses, meet schedules and deliver life-cycle cost savings. Having to meet those demands in every project ultimately may be one of the greatest benefits of adding P3s to the American transportation infrastructure toolbox.

- **P3s are often the preferred option for delivery of large, complex projects that add new capacity in heavily-travelled corridors or reconstruct deteriorating existing capacity on the Interstate Highway System.**

  With the need to generate a return on investment a prerequisite for bringing private investors into a transportation project, P3s are best suited for large projects with a high probability for strong revenue generation over many years.

  Unfortunately, despite the staggering cost of traffic congestion to the U.S. economy and quality of life, the federal government does not have a national strategic business plan for building additional transportation infrastructure capacity in all modes—or for even performing necessary reconstruction of existing capacity on the Interstate Highway System. Nor do many of the states.

  A new national initiative to build multi-modal "Critical Commerce Corridors" with dedicated truck lanes and connections to major airports, waterways, ports and rail hubs, for example, would lend itself quite well to the P3 model.

  To the contrary, however, much federal and state transportation, environmental and fiscal policy discourages investments in new transportation capacity. Thus the "market" for P3-like projects in the U.S. is, unfortunately, constrained.

  Perhaps two to four new P3 projects per year in the U.S. would be a reasonable assumption for the future.

- **While relatively few non-highway transportation P3s have been undertaken in the U.S. thus far, the P3 model has been used successfully to finance Denver's Eagle P3 rail project and could play a larger role in the financing of other transit and rail infrastructure projects.**

- **P3s can never be the "centerpiece" or even a major element of federal transportation programs. Proactive state actions are needed.**

  While the federal government can encourage private investment in transportation infrastructure through favorable tax treatments, supplementary loans and the easing of restrictions on tolling existing federally-funded assets, P3 transportation projects must be contracted with state and local governments or authorities.

  P3s are a state or local, not federal, decision. That is why when Congress writes the next federal surface transportation authorization, it would be a mistake to depend on private sector investment for meeting most of the nation's surface transportation capital needs.

My recommendations for increasing private investment in needed U.S. transportation infrastructure:

1. **Authorize the USDOT to Develop a "National Strategic Transportation Business Plan"**—Authorize in the next federal surface transportation law the development of a multi-modal "National Strategic Transportation Development Business Plan" aimed at achieving national goals and leading to necessary expansion of existing system capacity in all modes and the expensive reconstruction necessary to maintain existing capacity on the aging, original Interstate Highway System.

2. **Enhance TIFIA and PAB tools**—There are important transportation projects being planned now that will be able to arrange financing and start construction with support from existing federal programs. The amount of funding for the U.S. Department of Transportation's (USDOT) "Transportation Infrastructure Finance & Innovation Act" (TIFIA) should be substantially increased and the volume cap on tax-exempt "Private Activity Bonds" (PAB) should be removed. Decisions about which projects receive support should be made on based solely on project merits and economic benefits. Both tools serve to reduce the cost of capital in P3 financings and, thus, lower the tolls users must pay or the amount of availability-based payments from legislatures.

3. **Attract Pension Funds**—Congress should embrace a form of private "Build America Bonds" (BAB), indexed bonds, or other debt instruments that would attract critically needed investment from insurance companies and public-employee and union pension funds.

4. **Educate Governors, State Legislators and the Public**—P3s should be included in every state's transportation financing toolbox for use on appropriate projects and to provide much-needed supplemental dollars. The first step in this process is educating legislators and encouraging them to enact comprehensive P3 authorization laws. (This is currently a joint project of ARTBA and the National Conference of State Legislatures). Once in place, state DOTs should be encouraged to thoroughly consider the application of P3 techniques to all appropriate projects. Collectively, the transportation community must also do a much better job of educating the public on the true costs of providing and maintaining a safe and efficient transportation network.

5. **Further Ease Federal Restrictions on State Tolling of the Interstate Highway System**—It has been clearly demonstrated over the past two decades that the P3 approach can quickly deliver the high-cost, new capacity highway projects that are needed in many parts of the nation to meet current and

future mobility demands. Similarly, P3s are also well-suited to the expensive task facing all states of reconstructing and improving their existing—and aging—Interstate highway capacity.

It is also clear, however, that P3s require a new and consistent revenue stream to retire project debt and provide a fair return on investment to the private sector partners who help front the project's cost and assume the costs of operation and maintenance. Tolls imposed on a facility's users are a proven mechanism for providing that revenue stream.

Current federal law has four tolling and pricing "pilot programs" that allow a limited number of states the opportunity to impose tolls on their Interstate mileage for specific purposes: the "Express Lane Demonstration Program," the "Value Pricing Pilot Program," the "Interstate System Reconstruction & Rehabilitation Pilot Program," and the "Interstate System Construction Toll Pilot Program."

These programs should be made permanent and available to all states with the only restriction being that resulting revenue raised from users be exclusively dedicated to financing the reconstruction and improvement of the state's Interstate mileage and/or the addition of new Interstate capacity.

Conclusions

The United States has a comprehensive and relatively mature transportation infrastructure network in place. As a result, about 85 percent of the total public capital investment in the nation's transportation system in recent years is directed toward maintaining and repairing it, not constructing new facilities or adding capacity to existing ones.

Two decades of experience have shown that private investment is attracted to large, complex and expensive transportation projects that add new capacity to the U.S. system and can be supported by a new revenue stream, usually tolling. Thus, the overall market share for P3 projects in the overall U.S. transportation construction market has been—and likely will remain—fairly small, less than five percent per year.

The value of this contribution, however, should not be underestimated. For, absent significant increases in public funding, P3s will likely be the primary model for building new highway capacity in heavily congested urban areas in the decades ahead.

Given the economic and social toll caused by traffic congestion in the U.S. and the enormous unmet demand for new highway capacity to facilitate freight movement in an increasingly competitive international market, P3 projects should be aggressively encouraged and supported.

A Framework for Transportation Public-Private Partnerships in the U.S.

A History of Public Funding

The sustained and predictable public funding of transportation infrastructure in the U.S. for the past 50 years created a world-class road network. Federal and state fuel taxes and, to a lesser extent, tolls were dedicated to build and maintain many thousands of miles of highways. Federal grants paid for up to 90 percent of the cost of building the high-volume Interstates between cities. States and toll authorities built the regional expressway networks that provide the labor mobility and goods transport capacity needed for economic growth.

In some urban centers, the delivery of major infrastructure projects was corporatized through multi-state agencies like the Port Authority of New York and New Jersey, which was created in 1921. The concept of such an authority, whose balance sheet is composed of revenue-producing projects that are consolidated and used to finance other regionally important projects, is unique to the U.S.

The result of this long dedication to public funding of transportation in America is that historically U.S. governments haven't felt the need to develop alternatives to public delivery and operation of infrastructure. That perception began to change 25 years ago as capital needs grew faster than some states' highway budgets, and demands for greater efficiency grew.

Looking for a New Approach

One response from states was to experiment with alternative contracting methods such as design-build (DB) and design-build-operate-maintain (DBOM). These approaches place architecture/engineering and construction responsibilities—and sometimes operations and maintenance—under a single contract between a builder and the public agency providing the funding. This "master builder" assumes responsibility for the quality and accuracy of the final design, the cost and quality of the construction and for timely completion of the project. A key goal of these P3 contracting approaches is to avoid cost overruns and accelerate completion to reduce the impact of price escalation.

Also in the early 1990s, a few ideologically driven "privatization" projects were promoted and built by U.S. investors in Virginia (the Dulles Greenway) and California (SR 91 Express Lanes and SR 125 South Bay Expressway). In these early cases, governments assumed that private investors would be able to take over the entire public development process and deliver a self-supporting tollroad that the government would own after a 30-35 year concession period. All three roads were financed and are operating, but the original investors exited their projects, either through bankruptcy, a buyout or de-privatization by government.

Much experimentation with the P3 private financing model has occurred since those early projects. Besides P3s targeted at building new, greenfield capacity, investors before the credit crisis were willing to pay very high multiples for existing toll roads, most notably the Chicago Skyway and the Indiana Toll Road. Though market conditions have changed since those early leases were signed, many investors continue to look for opportunities to privatize mature assets rather than build new ones.

Meanwhile, Texas, Virginia, Florida and Colorado are adding new road and rail capacity to their most congested corridors with P3 concessions financed with public and private funds. There are eight P3 projects worth $13 billion that are under construction in these states. Each of the contracts is tailored to local needs. But all attempt to realistically share the considerable risks involved in planning, permitting, procuring, designing, building, financing, operating and maintaining P3 projects. Most or all of the DBFOM responsibilities are delegated to the private partner, leaving the high-risk pre-development work to government.

Not all P3 toll roads are financed with toll revenues. Florida has experimented with a P3 approach on I-595 wherein a private developer's profit is based on payments for achieving consistently high performance on an hourly basis once the contracted-for infrastructure service begins. Rather than have the private sector set and collect tolls, in this case Florida DOT will make availability-based payments to its P3 partner and collect the tolls itself, meaning the state assumes the risk that toll revenues will be enough to pay the availability fees.

California has taken this approach one step further on the Presidio Parkway P3 project in San Francisco, which the public sponsors hope to finance and start building this fall. No tolls will be collected. Instead, the legislature has agreed to annually appropriate the availability-based payments promised to the P3 developer for the 30-year term of the concession. That money will be used to secure about $300 million in loans to build the project, cover the developer's profit and pay all operating expenses.

A final note in this introduction—governments and toll authorities typically have reserved the most financially viable projects for public development. That means few, if any, of the P3 projects being built now or are being proposed for P3 development can support themselves financially with tolls alone. Investor equity and toll-revenue debt are frequently combined with public grants and federal financing support.

Contributions can come from taxpayers in the region benefitting from the new capacity, from state DOTs or legislatures, and from federal grants, tax assistance and loans. To build Virginia's I-495 Capital Beltway HOT lanes project, for example, $409 million in public funds were combined with $350 million in developer equity and about $1.2 billion in project-revenue debt in the form of tax-exempt bonds and federal loans.

Similarly, Texas DOT contributed about $1 billion in state funds to the financing of two toll road concession projects in the Dallas Metroplex in 2009 and 2010 worth $4.7 billion. In both cases, Virginia and Texas were able to leverage public funds to attract substantial amounts of equity and debt to make major transportation improvements and create jobs.

The federal government plays a large role in supporting P3 projects. This includes two critically important project financing tools: private activity bonds (PABs), which can be issued on behalf of private developers by a government agency at tax-exempt rates; and low-interest, long-term loans from U.S. DOT's Transportation Infrastructure Finance & Innovation Act (TIFIA) program.

Understanding Risk Transfer Options in Alternative Procurements

Design-Bid-Build (DBB)

Most construction contracting in the U.S. is done under a traditional design-bid-build model. The design and construction of a facility are procured in separate contracts with different companies. The public agency either designs the project itself, or more frequently, contracts with an engineering firm to perform the design work. The completed design is made available to contractors who offer fixed-price bids in a highly transparent and competitive process that result in a public award to the lowest bidder.

In a DBB procurement, the public agency has full control of the design and also assumes the risk in the construction contract that the design is accurate and complete. The public sponsor also assumes the financial responsibility for the proper operation and long-term maintenance of the facility and for obtaining funding or financing in a timely manner.

Considerations: Under a public delivery DBB model, the states retain all project risks including construction, traffic, revenue, financing, operations and lifecycle risks. Thus, *DBB requires significant owner expertise and resources* to coordinate one-piece-at-a-time delivery by multiple providers. Features include:

- No contractor input in design, planning or value engineering (VE);
- Owner at risk to contractor for design errors;
- Design and construction are sequential, typically resulting in longer schedules; and
- The construction cost is unknown until the contract award.

Design-Build (DB)

Design-build (DB) delivery is often used in the U.S. for large, complex projects. It places both architecture/engineering and construction responsibilities under a single contract between a public agency and a builder who assumes responsibility for the quality and accuracy of the final design, the cost and quality of the construction and for timely completion of the project.

A design-build contract is one of the foundation documents of a P3. It assures investors that potential construction risks have been allocated to one of the parties to the transaction. Putting a guaranteed price and schedule on the table also triggers the commitment of necessary up-front spending from the other members of the P3 consortium.

Because it comes comparatively early in the process, the price guarantee in a P3 is often based on insufficient subsurface information and a 30 percent design. The P3 construction price typically includes many contingencies and, therefore, is higher than a conventional competitive-bid price, which is based on more complete information. The guarantee is essential to moving the P3 process along, however.

Considerations: This method provides price and schedule risk transfer to the private sector during the construction phase but does not alleviate the financing burden from the government sponsors or provide the public with any risk transfer during the operating phase. *DB does not produce the life-cycle cost efficiencies that are the primary goal of a P3*. Other DB features include:

- Because it delegates some of the traditional public ownership functions, DB requires less owner expertise and resources;
- Construction often starts before design completion, thereby reducing project schedule. The construction cost is known and fixed during the design, so there is price certainty;
- There is a strong emphasis on cost control; and
- Compressing the design and construction schedule lessens the impact of price escalation.

Design-Build-Finance (DBF)

Under a DBF model the private sector provides gap financing during construction, designs and builds the project, while the public sponsors retain responsibility for operating and maintaining it. There are few examples of this in the U.S.

Considerations: This method may accelerate project delivery, reduce the impact of inflation on project costs and eliminate certain public financing risks. However, it does not promote synergies between the construction and operational phases as government would retain the risks and costs associated with operations and maintenance.

Design-Build-Operate-Maintain (DBOM)

The DBOM model transfers responsibility to the private sector for risks related to the design, construction, operations and maintenance of the project for the life of the contract. However, the responsibility and risks associated with financing the project are retained by the public sector.

Relatively few transit projects have been developed using this model, partly because equipment vendors have been uncomfortable guaranteeing the long-term performance of their equipment.

Considerations: This method provides for synergies between the construction and operational phases. It, however, does not relieve the financing burden on the public sector.

Design-Build-Finance-Operate-Maintain (DBFOM)

In the DBFOM model, the private sector designs, builds, finances, operates, and maintains the project for the contract term. The public sponsors may retain revenue risk, depending upon the payment mechanism being implemented.

Considerations: The public sponsors would define performance and transfer significant responsibility for meeting requirements to the private sector during the operating period. This structure can result in significant synergies, as the private sector may take a whole-life costing approach to both the construction and operational phases.

The "Concession" Model

This model transfers the most risk to the private sector. In addition to DBFOM responsibilities, the private developer under a long-term contract is granted the right to collect and retain toll revenues, along with accepting the risk that revenues will be sufficient to repay debt and equity investors. The primary role of equity investors in a P3 is to reduce lender exposure and take revenue risk. Equity's return on investment should reflect the level of uncertainty regarding potential repayment.

Considerations: The public sponsors retain some control throughout the operating period such as over tolling policies, possibly including limitations on maximum toll rates. This structure may result in significant synergies between construction and operational periods, and is structured to provide significant life-cycle cost savings.

U.S. Transportation P3 Projects (Incl. DB)

Contract amount in nominal $ ($ millions)	Project Name	Owner	Private Risk	Notice to Proceed	Private sponsor ($DB component)
3,850	Indiana Toll Road, IN	Indiana Finance Authority	75-yr lease	6/06	Cintra Concessions/Macquarie
2,800	I-635 LBJ Managed Lanes, TX	Texas DOT	DBFOM (toll)	6/10	Cintra/Meridiam ($2.1bn Ferrovial Agroman)
2,100	Denver Eagle P3 Rail, CO	Denver RTD	DBFOM (ap)	8/10	Fluor/Laing/Uberior ($1.27bn Fluor/BBRI)
2,047	North Tarrant Express, TX	Texas DOT	DBFOM (toll)	12/09	Cintra/Meridiam ($1.46bn Ferrovial)
1,998	I-495 HOT Lanes, VA	Virginia DOT	DBFOM (toll)	7/08	Transurban/Fluor ($1.4bn Fluor/Lane)
1,830	Chicago Skyway, IL	City of Chicago	99-yr lease	1/05	Cintra Concessions/Macquarie
1,814	I-595 Managed Lanes, FL	Florida DOT	DBFOM (ap)	2/09	ACS Infrast. ($1.2bn Dragados/EarthTech)
1,674	Hudson-Bergen Lt. Rail, NJ	NJ Transit	DB/Equip+O&M	10/96	Wash. Group/Itochu ($1.15bn Perini/Slattery)
1,376	I-15 Reconstruction, UT	Utah DOT	DB	3/97	Kiewit/Granite/Washington Group
1,369	SH 130 Seg. 1-4, TX	Texas DOT	DB	7/02	Fluor/Balfour Beatty/DMJM + Harris
1,358	SH 130 Segments 5-6, TX	Texas DOT	DBFOM (toll)	3/08	Cintra/Zachry
1,350	Alaskan Way Viaduct, Seattle	Washingtoin State DOT	DB	1/11	Dragados USA/Tudor-Perini
1,186	I-25 T-REX Road/Rail Exp., CO	Colorado DOT/RTD	DB	5/01	Kiewit/Parsons Trans. Group
1,100	I-15 South, UT	Utah DOT	DB	9/09	Fluor/Ames/Wadsworth + HDR
1,089	SR-99 tunnel, WA	Washington State DOT	DB	12/10	ACS/Tudor/Perini
1,002	DFW Connector, TX	Texas DOT	DB	10/09	Kiewit/Zachry
980	Jamaica-JFK Airtrain, NY	Port Auth. NY/NJ	DB/Equip+O&M	9/99	Skanska/Bombardier ($980m Slattery/Perini)
914	Port of Miami Tunnel, FL	Florida DOT	DBFOM (ap)	10/09	Meridiam ($607m Bouygues/Jacobs)
803	Foothill Eastern Toll Road, CA	Trans. Corridor Agencies	DB	6/95	Flatiron/Wayss & Freitag/Sukut/Obayashi
790	San Joaquin Hills Toll Rd., CA	Trans. Corridor Agencies	DB	9/91	Kiewit/Granite
773	SR 125 So. + Connectors, CA	Caltrans	DBFOM (toll)	5/03	Macquarie ($653m Washington/Fluor)
712	Alameda Corridor, CA	Alameda Corridor Trans. Auth.	DB	11/98	Tutor-Saliba/O&G Indus/Pars. Grp + HNTB
700	Safe and Sound Bridge, MO	Missouri DOT	DB	4/09	Kiewit/Traylor Bros. + HNTB/LPA Group
689	JFK Terminal 4, NY	Port Auth. NY/NJ	DBFOM	5/97	Schiphol/LCOR ($689m Fluor/Morse Diesel)
645	Foothill South Toll Road, CA	Trans. Corridor Agencies	DB	11/98	Flatiron/HBG/Sukut/Fluor Daniel
615	Tacoma Narrows Bridge, WA	Washington State DOT	DB	11/02	Bechtel/Kiewit
611	Pocahontas Parkway Lease, VA	Virginia DOT	99-yr lease	6/06	Transurban ($45m Fluor/WGI)
610	I-95 Relocation, Providence, RI	Rhode Island DOT	DB	6/97	Maguire Group/Cardi Construction
603	Northwest Parkway Lease, CO	Northwest Parkway Authority	99-yr lease	5/07	BRISA/CCR
600	Eastside Light Rail, CA	Los Angeles County MTA	DB	7/04	Washington Group/Obayashi/Shimmick
541	Cooper River Bridge, SC	South Carolina DOT	DB	7/01	Flatiron/Skanska + Parsons Brinckerhoff
530	BART SF. Airport Ext., CA	Bay Area Rapid Transit Dist.	DB	5/98	Tutor-Saliba/Slattery + HNTB
508	Trenton River Light Rail, NJ	NJ Transit	DB/Equip+O&M	6/99	Bechtel/Conti/Foster/Bombardier
469	I-75, Collier + Lee Counties, FL	Florida DOT	DBF	5/07	Anderson Columbia Co., and Ajax Paving
464	Intercounty Connector, MD	Maryland DOT	DB	6/07	Granite/Corman/GA & FC Waggoner
446	I-4 Connector, Hillsboro, FL	Florida DOT	DBF	1/10	PCL Civil Constructors/Archer Western
446	Western Wake Freeway, NC	NC Turnpike Authority	DB	8/09	Archer Western/Granite + The LPA Group
431	IROX I-75, FL	Florida DOT	DBF	6/07	Anderson Columbia/Ajax Paving
420	I-64 St. Louis, MO	Missouri DOT	DB	12/06	Granite/Parsons Trans. Group/URS
414	Highway 161, TX	No. Texas Tollway Auth.	DB	8/09	Fluor/Balfour Beatty + AECOM
390	Route 28 Expansion, VA	Virginia DOT	DB	10/03	Clark Constr./Shirley Contracting Corp.
390	SR 22 Improvements, CA	Orange Cty CA Trans. Auth.	DB	9/04	Granite/C.C. Myers/Steve P. Rados Inc.
390	LA Expo Lt. Rail, CA	Expo Line 1 Const. Auth.	DB	9/06	Flatiron/Fluor/Parsons Trans. Group
386	Conway Bypass Highway, SC	South Carolina DOT	DB	3/98	Fluor Daniel
385	Route 3 North, MA	Mass. Highways	DBF/Maint.	8/00	Modern Continental/Roy Jorgenson
350	Dulles Greenway Toll Road, VA	TRIP II	DBFOM (toll)	9/93	TRIP II ($150m Brown & Root)
343	Las Vegas Monorail, NV	L.V. Monorail LLC	DB/Equip+O&M	10/00	Bombardier/Granite

(ap) availability payments→ public credit) (toll) toll collections→project revenue credit)

Source: *Public Works Financing* "International Major Projects Database" 1985-2011

U.S. Transportation P3 Projects (Incl. DB)

Contract amount in nominal $ ($ millions)	Project Name	Owner	Private Risk	Notice to Proceed	Private sponsor (DB component)
328	281 North Toll, TX	Alamo Reg. Mobility Auth.	DB	5/08	Fluor/Balfour Beatty
324	E-470 Beltway, Seg. 2&3, CO	E-470 Public Hwy Auth.	DB	8/95	Washington Group Intl/Fluor Daniel
323	E-470 Seg. 1, CO	E-470 Public Hwy Auth.	DB	7/89	Fluor/Morrison Knudsen
295	US 550 (was SR 44), NM	New Mexico SH&TD	D/CM/Warranty	9/98	Koch Materials ($295m CH2M Hill/Flatiron)
291	Hiawatha Light Rail, MN	Minnesota DOT	DB	9/00	Granite/C.S. McCrossan
267	Gold Line Light Rail, CA	LA-Pasadena Blue Line Const.	DB	4/00	Kiewit/Washington Group
260	Anacostia River Bridges, DC	Washington DC DOT	DB	9/09	Skanska/Facchina
251	I-15 North, NV	Nevada DOT	DB	9/07	CH2M Hill/Las Vegas Paving Corp.
243	I-10 Bridges Escambia Bay, FL	Florida DOT	DB	4/05	Tidewater Skanska/Flatiron
238	TH 212, MN	Minnesota DOT	DB	8/05	Fluor/Edward Kraemer/Ames
238	I-15 Bridge Replacements, UT	Utah DOT	DB	1/06	Granite/Ralph L. Wadsworth Const.
236	Rt. 288, VA	Virginia DOT	DB/Warranty	12/00	Koch/APAC/CH2M Hill
234	St. Anthony Falls Bridge, MN	Minnesota DOT	DB	11/07	Flatiron/Manson + FIGG
233	E-470 Beltway, Seg. 4, CO	E-470 Public Hwy Auth.	DB	1/00	Kiewit/Washington Group
232	Palm Beach-Ft. Laud. Rail, FL	Tri-County Commuter Rail Auth	DB	8/01	Herzog/Granite/Washington Group
232	US 52 Reconstruction, MN	Minnesota DOT	DB	2/03	Fluor/Edward Kraemer/Ames
226	Carolina Bays Pkwy, SC	South Carolina DOT	DB	11/99	Flatiron/Tidewater
221	I-5 Everett HOT Lanes, WA	Washington State DOT	DB	5/05	Atkinson/CH2M Hill
220	Blue Line Extension, DC	WMATA	DB	4/02	Lane/Granite/Slattery Skanska
211	I-95 Widening, FL	Florida DOT	DBF	12/07	Community Ashpalt
198	Rt. 28 Corridor, VA	Virginia DOT	DB	9/02	Clark Const./Shirley Contracting Corp.
192	US 17 Washington Bypass, NC	North Carolina DOT	DB	2/06	Flatiron/United Contractors
191	Southern Connector, SC	Connector 2000 Assn.	DBF	2/98	Interwest ($na Thrift Bros.)
191	Atl. City-Brigantine Tunnel, NJ	New Jersey DOT	DBF	10/97	Mirage Resorts ($191m Yonkers/Granite)
184	U.S. 60 Upgrade, AZ	Arizona DOT	DB	5/01	Granite/Sundt
180	Northwest Parkway, CO	NWP Public Highway Auth.	DB	6/01	Washington Group/Kiewit Western
180	I-205 LRT Extension, OR	TriMet Portland	DB	1/06	Stacey & Witbeck/Granite
178	US 183, Austin, TX	Central Tex. Mobility Auth.	DB	12/04	Granite/J.D. Abrams + URS175
177	Palmetto Exp. Widening, FL	Florida DOT	DBF	8/08	Condotte-De Moya j.v.
171	Reno ReTRAC, NV	City of Reno	DB	7/02	Granite/Parsons Trans. Group
148	US Route 1, Key West, FL	Florida DOT	DB	11/04	Granite + Jacobs
140	I-485, Charlotte Loop, NC	North Carolina DOT	DBF	6/10	Blythe Construction/Wilbur Smith Assoc.
138	Triangle Parkway, NC	NC Turnpike Authority	DB	8/09	S.T. Wooten
138	95 Express Lanes, FL	Florida DOT	DB	2/08	FCC Co./MCM Corp.
136	I-494 Reconstruction, MN	Minnesota DOT	DB	8/04	Granite/C.S. McCrossan
132	U.S. 64 Knightdale Bypass, NC	North Carolina DOT	DB	6/02	Flatiron/Lane Const. Corp.
130	91 Express Lanes, CA	CalTrans	DBFOM (toll)	7/93	Level 3/Cofiroute/Granite (sold 1/03)
130	U.S. 20, OR	Oregon DOT	DB	7/05	Granite/TY Lin International
129	U.S. 70, NM	New Mex. SH&TD	DB	7/02	Granite/Sundt/James Hamilton + URS
127	Orange Line Bridge, OR	TriMet Portland	DB	12/10	Kiewit
125	Portland Airport Max Rail, OR	TriMet Portland	DB	10/98	Bechtel
121	95 Express Lanes, FL	Florida DOT	DBF	1/08	FCC/MCM
111	US-1 Improvements, FL	Florida DOT	DBF	11/07	Community Asphalt
100	Jordan Bridge, VA	Chesapeake, VA	BOO	1/11	Figg/American Infra MLP/Lane ($100m Lane)
102	I-4 Over St. John's River, FL	Florida DOT	DB	1/01	Granite/PCL Civil Constructors
86	I-17 Thomas to Peoria, AZ	Arizona DOT	DB	1/99	Granite/Sundt

(ap) availability payments→public credit) (toll) toll collections→project revenue credit)

Source: *Public Works Financing* "International Major Projects Database" 1985-2011

U.S. Transportation P3 Projects (Incl. DB)

Contract amount in nominal $ ($ millions)	Project Name	Owner	Private Risk	Notice to Proceed	Private sponsors (DB component)
85	Camino Colombia Bypass, TX	Texas DOT	BOO (toll)	6/99	Granite + Carter & Burgess
82	Hathaway Bridge, FL	Florida DOT	DB/Warranty	6/00	Granite
81	Sawgrass Expwy Widen, FL	Fla. Turnpike Enterprise	DB	4/05	APAC/Parsons Trans. Group
59	I-77 Rehab, NC	NC DOT	DB	3/07	The Lane Construction Corp. +HDR
57	Anton Anderson Tunnel, AK	Alaska DOT	DB	9/98	Kiewit + Hatch Mott MacDonald
56	Belt Parkway, NY	NYC DOT	DB	7/02	Granite Halmar + Gannett Fleming
54	Carolina Bays, ph. 2, SC	South Carolina DOT	DB	5/03	APAC + Wilbur Smith Assoc.
53	New River Bridge, FL	Tri-County Commuter Rail	DB	2/03	Washington Group

(projects under $50 million not recorded)

(ap) availability payments→ public credit) (toll) toll collections→project revenue credit)

Source: *Public Works Financing* "International Major Projects Database" 1985-2011

Canadian Transportation P3 Projects (Incl. DB)

Contract amount in nominal $ ($ millions)	Project Name	Owner	Private Risk	Notice to Proceed	Sponsor (DB component)
2,600	ETR 407, Toronto, ON	Ontario Ministry of Trans.	99-yr lease	5/99	Cintra Concessions/Macquarie
2,460	Port Mann Bridge, BC	BC Ministry of Transportation	DB	2/09	Kiewit/Flatiron
2,000	Canada Line, Vancouver, BC	Gr. Vancouver Transit Auth.	DBFOM (ap)	8/05	SNC Lavalin/Serco ($1.2bn SNC Lavalin)
1,430	A-30, Montreal, QC	Ministry of Transport	DBFOM (ap)	9/08	Acciona/Iridium (Dragados/SICE/Arup)
1,340	Edmonton Orbital (NW), AB	Alberta Transportation	DBFOM (ap)	7/08	Bilfinger Berger (Flatiron/Parsons/Graham)
814	Golden Ears Bridge, BC	TransLink/Partnerships BC	DBFOM (ap)	3/06	Bilfinger BOT ($746m Bilfinger/CH2M Hill)
765	Southeast Stoney Trail, AB	Province of Alberta	DBFOM (ap)	5/10	SNC Lavalin/Acciona (same DB)
730	Confederation Bridge, PEI	Public Works Canada	DBOM (toll)	10/93	Vinci/BPC Marine/Ballast Nedam/SCI
705	So. Fraser Perimeter Road, BC	BC Ministry of Transportation	DBFOM (ap)	7/10	ACS/Ledcor ($650m Dragados/Ledcor)
597	Sea-to-Sky Highway, BC	BC Ministry of Transportation	DBFOM (ap)	9/05	Macquarie ($354m Kiewit/Miller/Capilano)
555	Northeast Stoney Trail, AB	Province of Alberta	DBFOM (ap)	2/07	Bilfinger ($345m Flatiron/Graham/Parsons)
538	A25 Montreal, QC	Quebec Ministry of Transport	DBFOM (ap/toll)	9/07	Macquarie ($207m Kiewit/Parsons)
500	Trans Canada Highway, NB	NB Trans Ministry	DBOM	11/98	Dragados-FCC/Vinci/Miller Paving
500	Route 1, NB	Province of New Brunswick	DBFOM (ap)	4/10	Dexter Group (Dexter Construction)
395	Edmonton Orbital SE, AB	Alberta Min. of Trans.	DBOM (ap)	1/05	Macquarie/PCL/LaFarge
300	Ontario Service Centres, ON	Ontario Min. of Transportation	DBFOM	8/09	HMS Host/Kilmer Van Nostrand (Ellis Don)
200	Kicking Horse Canyon, BC	BC Min. of Transportation	DBFOM (ap)	2005	Bilfinger BOT ($114m Flatiron/Parsons)
195	Disraeli Freeway Bridge, MB	City of Winnipeg	DBFM (ap)	3/10	Plenary Group (PCL Constructors)
175	York, ON BRT	Regional Muni of York	DBFOM (ap)	6/02	Nine firms (Kiewit/Delcan)
120	Okanagan Bridge, BC	BC Dept. of Transport	DBFOM (ap)	5/07	SNC Lavalin
83	Hwy 104 Cobequid Pass, NS	Nova Scotia MOT	DBOM	5/96	CHIC: Aecom/AMEC/Dufferin

(ap) availability payments→ public credit) (toll) toll collections→project revenue credit)

Source: *Public Works Financing* "International Major Projects Database" 1985-2011

U.S. Transportation Concessions, 1993-2010

Notice to Proceed	Project Name	Public Sponsor	Risk	Project cost (nominal $ mil.)	Developer ($ capital/design-builder)
Operating					
7/93	91 Express Lanes, CA	Caltrans	DBFOM (toll)	130	Level 3/Cofiroute/Granite (sold to gov't. 1/03)
9/93	Dulles Greenway, VA	Virginia DOT	DBFOM (toll)	350	TRIP II ($150m/Brown & Root)
5/99	Foley Beach Express, AL	City of Foley, AL	BOO (toll)	44	Baldwin County Bridge Co.
6/99	* Camino Colombia Bypass, TX	Texas DOT	BOO (toll)	90	Landowners (Granite) (TXDOT purchased 1/04)
10/00	* Las Vegas Monorail, NV	Clark County, NV	DBFOM (farebox)	343	Las Vegas hotels ($331m /Bombardier–Granite)
TF 5/03	* SR 125 So. Bay Express, CA	Caltrans	DBFOM (toll)	773	PBI/Macquarie ($653m /Fluor_Washington)
1/05	Chicago Skyway, IL	City of Chicago	99-yr lease (toll)	1,830#	Cintra Concessions/Macquarie
6/06	Indiana Toll Road, IN	Indiana Finance Authority	75-yr lease (toll)	3,850#	Cintra Concessions/Macquarie
TF 6/06	Pocahontas Parkway Lease, VA	Virginia DOT	99-yr lease (toll)	611#	Transurban ($45m /Fluor–Washington)
5/07	Northwest Parkway Lease, CO	Northwest Parkway Auth.	99-yr lease (toll)	603#	BRISA
Under construction					
TF 12/07	I-495 HOT Lanes, VA	Virginia DOT	DBFOM (toll)	1,998	Transurban/Fluor ($1.4bn /Fluor–Lane)
TF 3/08	SH 130 segments 5-6, TX	Texas DOT	DBFOM (toll)	1,358	Cintra/Zachry ($968m /Ferrovial–Zachry)
TF 2/09	I-595 Managed Lanes, FL	Florida DOT	DBFOM (ap)	1,814	ACS Infrast. ($1.2bn /Dragados–EarthTech)
TF 10/09	Port of Miami Tunnel, FL	Florida DOT	DBFOM (ap)	914	Meridiam ($607m /Bouygues–Jacobs)
TF 12/09	North Tarrant Express, TX	Texas DOT	DBFOM (toll)	2,047	Cintra/Meridiam ($1.46bn /Ferrovial)
TF 6/10	I-635 LBJ Managed Lanes, TX	Texas DOT	DBFOM (toll)	2,800	Cintra/Meridiam ($2.1bn /Ferrovial Agroman)
8/10	Denver Eagle PPP Rail, CO	Denver RTD	DBFOM (ap)	2,100	Fluor/Laing/Uberior ($1.27bn /Fluor–BBR)
1/11	Jordan Bridge, VA	Chesapeake, VA	BOO (toll)	100	Figg/Amer. Infra. MLP/ Lane ($100m/Lane)

TF– financing includes USDOT TIFIA loan
* bankrupt
# discounted present value of excess cash flow
! Parsons Brinckerhoff
BOO=build-own-operate

(toll) toll collections→project revenue risk
(ap) availability payments→ gov't. annual appropriations risk
(farebox)→ridership risk

Chart Summary

$21.7bn in public and private funds invested since 1993

- $6.9bn invested in four brownfield leases of existing toll roads
- $12.4bn invested in 11 highway and bridge capacity additions
- $2.4bn invested in two urban transit projects

Deal flow is accelerating . . .

From 2008–2010
- $13bn invested in eight projects
  - > First major urban transit P3
  - > Five major capacity additions in three states whose capital costs together ($7.7bn), when annualized, represent 11% of all spending on new U.S. access-controlled expressways ($11bn/yr) in 2011.

P3 developers with U.S. projects
ACS—Spain
Cintra/Ferrovial—Spain
Figg Bridge Developers—U.S.
Fluor—U.S.
Macquarie—Australia
Meridiam—France
Transurban—Australia
Zachry—U.S.

Firms seeking opportunities
Acciona—Spain
Bechtel Enterprises—U.S.
Balfour Beatty Capital—U.K.
China Construction America—China
Global Via—Spain
Isolux Corsán—Spain
OHL—Spain
Parsons—U.S.
Skanska—Sweden
SNC Lavalin—Canada
Soares Da Costa—Portugal
Vinci—France

Source: *Public Works Financing* "International Major Projects Database" 1985-2011

U.S. Private Finance Project Pipeline

Transportation P3 projects in procurement, planning
May 2011

Airports	($ million)	Status
California, Ontario Airport service contract	na	feasibility
Florida, Hendry County, Airglades	na	feasibility
Georgia, Gwinnett County, Briscoe Field	na	procurement
Illinois, Chicago, Midway	2,500	feasibility
Puerto Rico, San Juan, Louis Muñoz Marin	na	procurement
Rail		
California, LA, Crenshaw Blvd. Corridor	1,500	feasibility
California, LA, Westside Subway Ext.	4,200	feasibility
California, LA Regional Connector	1,300	feasibility
Hawaii, Honolulu Elevated Rail	5,500	feasibility
Nevada-California, DesertXpress	3,500	procurement
Texas, Dallas-Ft. Worth Cotton Belt LRT	1,000	feasibility
Ports		
Pennsylvania, Phil. Southport Terminal	***300***	**procurement**
Texas, Corpus Christi, LaQuinta Terminal	800	procurement
Toll Roads		
Alabama-Florida I-10-Connector	na	feasibility
Arizona, Phoenix Managed Lanes	na	feasibility
California, Bay Area Express Lanes	3,700	feasibility
California, LA High Desert Corridor	6,000	feasibility
California, LA I-710 Corridor	2,600	feasibility
Colorado, Denver, Jefferson Parkway	212	procurement
Colorado, Denver E-470 lease	na	feasibility
Georgia, I-75/I-575 Managed Lanes	***1,400***	**procurement**
Georgia, I-285/I-20 Managed Lanes	**1,200**	**procurement**
Georgia, Ronald Reagan Exp. extension	na	feasibility
Illinois, Elgin-O'Hare West Bypass	3,600	feasibility
Indiana-Illinois, Iliana Expressway	1,000	feasibility
Nevada, I-15/US 95 HOT Lanes	750	feasibility
Puerto Rico, PR 22 + PR 5 lease	***2,000***	**procurement**
Puerto Rico, PR-22 Extension	825	feasibility
Puerto Rico, PR 52 + 20 lease	na	feasibility
Puerto Rico, PR-66 + 53 lease + extend	na	feasibility

Toll Roads	($ million)	Status
Texas, Austin Mo-Pac Exp. Lanes	248	feasibility
Texas, Dallas North Tarrant Exp. 3A/3B	***1,355***	***under contract***
Texas, Dallas North Tarrant Exp. 3C/4	1,200	feasibility
Texas, Cameron County SH 550	1,000	procurement
Texas, Dallas SH 183 Managed Lanes	1,400	feasibility
Texas, Houston SH 99 Grand Parkway	5,300	feasibility
Texas, Dallas I-35E	2,265	feasibility
Virginia, I-95 HOT lanes	**1,050**	**under contract**
Virginia, Route 460	2,200	procurement
Toll Bridges		
Alaksa, Anchorage Knik Arm Bridge	1,077	feasibility
Michigan-Ontario, Detroit-Windsor Bridge	949	procurement
Indiana-Kentucky, Louisville Bridges	4,100	feasibility
New York, Buffalo Harbor Bridge	100	feasibility
New York, Goethals Bridge	**1,000**	**procurement**
New York, Kosciuszko Bridge replacement	1,000	feasibility
New York, Robert Moses Causeway	250	feasibility
New York, Tappan Zee Bridge	9,500	feasibility
North Carolina, Mid-Currituck Bridge	660	feasibility
Pennsylvania, Scudder Falls Bridge	310	feasibility
Wash.-Ore., Columbia River Bridge-LRT	3,600	feasibility
Toll Tunnels		
California, LA SR 710 Gap Closure	5,000	feasibility
Virginia, Norfolk Midtown Tunnels	***2,000***	procurement
Virginia, Hampton Roads Bridge-Tunnel	4,000	feasibility
Untolled Highways		
California, San Fran., Presidio Parkway	***359***	***under contract***
Miscellaneous		
Georgia, Atlanta Multimodal Terminal	na	under contract
New Jersey, NJ Transit Parking Lots	na	procurement
New York City parking meters	na	feasibility

Source: *Public Works Financing* "International Major Projects Database" 1985-2011

A panel of experts has determined that projects in boldface may reach financial close in 2011-12, depending on whether TIFIA loans are available.

The Global Transportation P3 Experience

P3s are widely used as an infrastructure delivery mechanism in many countries outside the United States.

With varying levels of government encouragement and financial support, Canada, the United Kingdom, Ireland, Spain, Portugal, Chile, Australia, South Korea and others have advanced their own models. *[Public-Private Partnerships for Highway Infrastructure: Capitalizing on International Experience, FHWA]*

Spain started awarding highways concessions in 1960 and now 27 percent of its National Highway System—2,672 miles—is privately operated. All new highways in New South Wales, Australia, are developed using P3s.

About 10 percent of all infrastructure spending in Canada is done through P3s.

Driving these programs internationally is a desire to:

- Address investment gaps;
- Price road use;
- Cure deficiencies in traditional procurement approaches;
- Reduce life-cycle costs; and
- In some cases, push P3 project debt off balance sheets in order to meet limits on national debt and deficits.

The Transportation P3 Experience In the United States 1989 - 2011

When viewed broadly as an alternative delivery mechanism aimed at increasing construction efficiency, P3s have made a substantial contribution in the United States over the past almost two decades. The P3 options grouped together here include both publicly funded design-build and DBOM projects as well as privately financed DBOM's and concessions. Using that broad definition, the data show:

- **24 states and the District of Columbia have used a P3 process to help finance and build at least 96 transportation projects worth a total $54.3 billion.**

  The implementing states include: Alaska, Alabama, Arizona, California, Colorado, Florida, Illinois, Indiana, Maryland, Massachusetts, Minnesota, Missouri, Nevada, New Jersey, New Mexico, New York, North Carolina, Oregon, Rhode Island, South Carolina, Texas, Utah, Virginia and Washington.

  - **Sixty-five percent of these projects occurred in just eight states**—Florida (10), California (11), Texas (18), Colorado (9), Virginia (7), Minnesota (2), North Carolina (2), and South Carolina (3).

  - **One-third of these project starts occurred in one of four years**—2009 (10), 2002 (8), 1998 (8) and 2000 (7).

- **26 states have not initiated a P3 transportation project.** These include: Arkansas, Connecticut, Delaware, Georgia, Hawaii, Idaho, Iowa, Kansas, Kentucky, Louisiana, Maine, Michigan, Mississippi, Montana, Nebraska, New Hampshire, North Dakota, Ohio, Oklahoma, Pennsylvania, South Dakota, Tennessee, Vermont, West Virginia, Wisconsin and Wyoming.

- **On average, over the past 10 years, 2001 through 2010, five states started a transportation P3 project each year.**

- **Of the $54.3 billion in transportation P3 contracts let over the past 22 years, almost 75 percent of the contract value is accounted for by eight states**—Texas ($9.57 billion, 17.6 percent), California ($6.02 billion, 11.1 percent), Florida ($5.63 billion, 10.4 percent), Colorado ($4.85 billion, 9 percent), Indiana ($3.85 billion, 7.1 percent), Virginia ($3.88 billion, 7.1 percent), Utah ($3.66 billion, 6.7 percent), and New Jersey ($3.35 billion, 6.2 percent).

- **79 of the transportation P3 projects, worth $31.5 billion, have been either Design-Build (DB), Design-Build-Finance (DBF), or Design-Build-Operate-Maintain (DBOM) contracts.**

- **11 of the transportation P3 projects, worth $12.4 billion, have been either Design-Build-Finance-Operate-Maintain (DBFOM) contracts or straight concessions involving traffic forecasting risk.**

- **Over the period, there have been four transportation asset privatizations with total up-front payments to government valued at $6.9 billion.** These include the:

    - Indiana Toll Road (Indiana Finance Authority) in 2006—a 75-year lease for $3.85 billion;

    - Chicago Skyway (City of Chicago) in 2005—a 99-year lease for $1.83 billion;

    - Pocahontas Parkway (Virginia Department of Transportation) in 2006—a 99-year lease for $611 million; and the

    - Northwest Parkway (Colorado, Northwest Parkway Authority) in 2007—a 99-year lease for $603 million.

- **P3 market share is growing.**

  Despite the credit crisis, the pace of deal flow for new projects has increased markedly since 2008. A total of $13 billion in public funds and investor financing has been committed to build eight P3 transportation projects in the past three years, including a major rail expansion in Denver (see P3 history chart).

  Counting only the seven highway projects, the dollar value of P3s put under construction in the past three years accounted for about 2 percent of all federal, state and local capital spending on highways. (All government spending = $90 billion per year vs. highway P3s = $1.65 billion per year = sum of annualized capital spending for seven projects.)

  When measured against annual spending by all governments for new expressway capacity, however, P3's market share grows considerably.

  Five P3s totaling about $7 billion in capital costs have been put under construction since 2008 with the goal of increasing new expressway capacity, in all but one case, through adding managed lanes. Annualized capital spending of these five together is roughly $1.4 billion, compared to about $11 billion per year in state and federal funds spent for all new capacity. So **P3's market share of annual spending on new highway capacity additions is about 11 percent during 2011.**

  (NOTE 1: In 2006, the latest year data is available, federal/state capital outlays for access-controlled facilities was about $22 billion. About 50% of that was spent for new roads and bridges or added lanes.)

  (NOTE 2: According to data provided by CitiGroup for this report, only two municipal revenue bond financings for greenfield toll roads, totaling $857 million, have been closed since May, 2005, both for the North Carolina Turnpike Authority. A total of 12 such public projects have been funded with $8.1 billion in tax-exempt revenue bonds since 1993. Of those public toll authority projects, three were over $1 billion.)

  P3 developers consulted for this paper expect deal flow to be two to four projects a year, about the same as in the past few years (see Deal Flow chart). So the current market share percentages for P3s probably will continue, and may, in fact, grow as the unmet demand for new capacity grows.

The Evolution of Transportation P3s In the United States

Model 1: Nonprofit Development

The first "modern era" P3 toll road in the United States took shape in 1986, when the newly-formed E-470 Authority in Colorado initiated the planning for a missing link in the Denver regional freeway system —an outer loop that would eventually connect to greenfield development and a new international airport.

The Authority, formed by eight counties and cities east of Denver, had no money, marginal support, a small (but dedicated) staff and a borrowed office.

To support the Authority's goal, private road builders agreed to fund the project development costs of the high-risk startup segments under a 63-20 nonprofit ownership structure that allowed use of tax-exempt debt financing. The companies were repaid once the project revenue bonds were issued. The companies also agreed to take some of the subordinated debt issued for the greenfield projects as part of their compensation for their construction services.

Ultimately, four segments of the toll road—totaling 46 miles—were opened by 2003 on the east side of metro Denver.

Subsequent 63-20 projects in the mid-1990s used the same provision in the federal tax code to allow private developers to finance non-profit toll road projects with bonds issued in the tax-exempt municipal market. Unfortunately, two of three of those P3 projects went bankrupt, largely due to the effect of economic recession on optimistic traffic forecasts, but also because there was no equity owner to pay for the traffic forecasting mistake. The third, Pocahontas Parkway, still had an investment grade bond rating from Fitch at the time of its sale to Transurban. The sale by the Virginia Department of Transportation was to facilitate recovery of maintenance costs, which by contract, were deferred.

Model 2: Pure Privatization

A few of the earliest P3 projects—20 years ago in California and Virginia—were full privatizations with no state risk. All relied solely on toll revenues to repay investors. One in California, the South Bay Express, went bankrupt during 2010. The other California privatization project, the SR 91 Express Lanes, was purchased very profitably by a public toll agency.

The Virginia project—the Dulles Greenway outside Dulles International Airport—is currently struggling with high debt and low traffic.

Model 3: Monetizing Assets (Build-Lease)

Next, in 2005, there came a period of investor exuberance for privatizing existing infrastructure assets (amid high bank liquidity and cheap money worldwide). That allowed the City of Chicago to monetize its Skyway toll road with private investors for $1.8 billion, well above the valuation provided by Goldman, Sachs.

Chicago's lease was followed by an auction for the Indiana Toll Road in 2006 that netted $3.85 billion for the state, again far above the valuation.

In both cases, the winning bids from the foreign investors for those toll roads were roughly $1 billion higher than the next highest bids.

Two more leases of distressed toll road assets followed in 2006 and 2007—in Virginia and Colorado. Then Chicago signed a $563-million lease in 2007 to monetize four of the city's parking garages. Puerto Rico is now planning to lease a major road and the San Juan Airport during 2011 to help address its extreme budget crisis.

Fiscal strains may lead other jurisdictions to consider privatizing their transportation assets. On the plus side, tax and accounting treatment make proceeds from a private lease higher than they would be from a public monetization. And many P3 advisors are promoting these transactions, partly because they can be done relatively quickly.

On the down side, all of the monetized toll roads in the U.S. have been a disappointment to investors so far. Also, current valuations of similar assets have fallen and multiples are much lower, meaning up-front payments may not be large enough to win over skeptical legislatures.

There have also been some notable failures in this market segment in the past few years. Among them are the Pennsylvania Turnpike, the New Jersey Turnpike and Alligator Alley in Florida, plus most of the recently proposed parking privatizations, all due to strong political opposition.

There is one very profitable example of the build-lease model in North America—the Highway 407 toll road in Toronto, Canada. The Province of Ontario funded construction of the 65-mile-long congestion reliever and operated it as a public toll road for 15 months before auctioning it to the highest bidder in 1999.

The 99-year agreement negotiated by the province gave the developer control of toll rates. That and the winner's installation of a sophisticated toll collections system and other improvements have made Highway 407 the most valuable toll concession in the world, with an asset value in 2010 of $10 billion.

Model 4: Lease-Buyback

The most successful P3 project operating in the U.S., the SR 91 Express HOT lanes, was developed privately and sold to a local government authority in 2003, after eight years of private operation. It was the first major toll road concession in the U.S. and consists of four premium-priced lanes extending for 10 miles in the median of the Riverside Freeway in Orange County, California.

The U.S. and French investors sold their 35-year franchise at a profit to the Orange County Transportation Authority, which manages the county's highway and transit programs.

SR 91 has proven to be an important, national demonstration of the potential for pricing new capacity built in the middle of a heavily congested freeway, and of the ability to manage demand through variable tolling. It also has been a windfall for Orange County. About 40 percent of all traffic in the corridor during peak periods chooses to use the premium-priced HOT lanes. Revenues peaked in 2007 at $40.5 million, and fell slightly during the recession. That's a hefty return on a 10-mile project that cost less than $125 million to build in 1994-95 and $207 million for the authority to buy in 2003.

Toll rates on SR 91 have quadrupled under public ownership. The congestion-priced toll on SR 91 Express Lanes when in opened in December 1995 under private operation was $2.50 during peak travel periods. The current peak-period toll, at 5 p.m. on Fridays, is $9.80. Toll rates are set to meet bond covenants negotiated by Orange County that require the public authority to charge tolls high enough to maintain free flow at all times.

Model 5: Concessions/Managed Lanes

P3s occupy an important place in a growing niche of the U.S. transportation market—the financing of new urban highway capacity to relieve severe congestion by adding variably priced managed lanes to existing freeways. As conceived of now, large segments of these new networks would consist of free, high-occupancy vehicle (HOV) lanes converted to high-occupancy toll (HOT) lanes under long-term concession agreements.

Cost savings from converting HOV lanes to HOT (as opposed to building all new capacity) are a key driver of public and private development efforts on the west coast, where HOV lanes exist on the majority of all freeways in greater Los Angeles, San Francisco and Seattle. HOV conversions have also been done in Minneapolis and Miami and are also are planned or already underway in Atlanta, Houston and Washington, D.C.

These managed lanes represent new choices for drivers, optimize the effective utilization of all capacity and are generally perceived as "win-win" for both users and non-users, who benefit from free road space vacated by users of the HOT lanes.

In essence, all types of managed lanes preserve a portion of capacity that is free flowing and make it available for all drivers to use when they really need it. This is an important concept in an urban transportation future in which some believe it will be increasingly difficult to build out of congestion.

Since 2008, three managed-lanes P3s—ranging in cost from $2 billion to $3 billion—were financed and put under construction in Virginia and Texas. A fourth, I-595, costing $1.8 billion, was financed in 2009 using availability-based payments from the State of Florida, which will collect the tolls itself.

There is a perception that new toll road capacity added to heavily congested freeways should be able to pay for itself without public support. In fact, only one of about a dozen managed lanes projects operating in the U.S.—SR 91—is self supporting. The others are not profitable because of high costs and public policy decisions about which vehicles—express buses, hybrid cars, HOVs—should get free access to the toll lanes. The degree of crowding out of toll-paying customers largely determines the amount of public subsidy needed.

The largest HOT-lane P3 project in the U.S., on the I-495 Capital Beltway in Virginia, for example, will serve a large number of vanpools, HOV customers, some buses and emergency vehicles. A substantial, one-time infusion of state funds was necessary to help pay the high cost of urban construction. But it is designed to

fully support its private debt repayment and its operating/replacement cost over the 85-year concession period.

There is considerable demand for these projects. The Texas Transportation Institute is tracking 29 managed lanes projects that are under development in the U.S., though not all are P3s. Four managed lanes projects are moving toward financial close as P3s in the next two years—Downtown/Midtown tunnels in Norfolk, Virginia, I-75/I-575 in Atlanta, the final phase of 3A/B of the North Tarrant Express in Dallas-Fort Worth, Texas. Closure on the North Tarrant 3C/4, is to come.

In support of managed lanes as part of its sustainable transportation policy, the U.S. Department of Transportation on January 25, 2011, announced that TIFIA loans may continue to be made available to projects that use "tolling or pricing strategies that reduce or manage high levels of congestion on highway facilities and encourage the use of other transportation options." *(Federal Register Jan. 25, 2011). How that policy will work out in practice has not yet been determined.*

Decades of effort by FHWA and states to introduce pricing as a tool to manage congestion, however, is being threatened by two members of Congress from Los Angeles who are attempting to stop the conversion of HOV lanes on I-10 and I-110 to HOT lanes. Rep. Gary Miller (R-CA) and Rep. Maxine Waters (D-CA) are trying to ban such tolling of free Interstate capacity in the forthcoming federal surface transportation reauthorization bill. For Miller, the argument is that these lanes are "already paid for," while Waters says she believes tolling would create a "traffic system of haves and have-nots."

What Transportation P3s Can Do

Transportation P3s in the United States and abroad have a common set of attributes that, in practice, have delivered considerable benefits to users and taxpayers. They include:

1. Transportation P3s move risks from taxpayers to investors.

One of the inherent differences between traditional infrastructure development and this type of P3 is the risk-allocation through financial structures. The private sector isolates and allocates specific project risks to the P3 development team and to investors, who suffer losses if construction cost estimates or traffic forecasts are wrong. The public sector is left standing alone when trouble strikes and allocates risk to users or taxpayers in the community at-large.

In a concession, a project company is formed to create a transportation enterprise that is intended to make a profit, currently targeted at about 12 percent, over many years. The company is a stand-alone entity seeking to build and operate one asset. Only forecasted cash flows from that asset will be available to repay lenders, so they typically require significant equity contributions from the project company's owners (for toll projects, typically 20-40 percent of total project costs, and for availability pay projects, about 10 percent) in order to provide a cushion if the project does not meet forecasted revenues.

Neither the creditors nor the project company are typically given rights to increase tolls in the event of a shortfall in cash flows (see P3 Contractual Provisions). Tolls are required to be maintained within the parameters set forth in the original concession agreement. Therefore, when a road underperforms, there is no tangible effect on the users of the facility or the community at-large.

In a worst-case scenario, the developer can file for bankruptcy or default on the loan at which point the lease may revert back to the state or the procuring agency. This is currently the situation occurring on the South Bay Expressway (SBE) in southern California.

Revenues on the SBE had been below forecast since the road opened in late 2007 and fell steeply during the recession. The private investors lost all their equity and filed for bankruptcy in March 2010. Negotiations between creditors resulted in new ownership and restructured debt being approved by the bankruptcy court in April 2011. Through it all, there has been no impact on the customers or government, and tolls have not been increased beyond the levels allowed in the concession agreement.

2. Transportation P3s incentivize efficiency

The primary reason for choosing any specific model for the provision of surface transport infrastructure should be to increase efficiency and cost-effectiveness (i.e., value for money). Layers of efficiencies resulting from the right alignment of interests and incentives in a P3 can produce substantial overall cost savings when compared with traditional delivery methods.

A key inefficiency inherent in the public model is government's short-term budgeting process which limits the resources available and options for life-cycle cost management.

3. Transportation P3s can reduce the impact of materials price escalation and other sources of inflation by shortening the delivery schedule

P3s have the ability to pull transportation projects forward, sometimes by decades. In times of even mild inflation, this can account for considerable savings.

Over time, government's "pay-as-you-go" system is not well-suited for the delivery of large, long-term capital projects. It also does not always make sense for the public sector to incur the debt required to finance these projects. Thus, in certain cases, the private sector may be able to finance and deliver projects sooner and at lower cost and risk than the public sector.

With sophisticated investors as their partners, private developers and contractors have strong incentives to bring projects in on time to ensure that they begin generating revenue and to mitigate any contractual penalties for late delivery.

4. Transportation P3s bring added expertise, technology

Involving the private sector can also often produce savings from specialized managerial skills that the public sector cannot always afford to develop on its own, as well as access to new technology and software, which, in many cases, has been developed by private concessionaires.

Challenges to Transportation P3s in the U.S.

Including privately financed P3s as an option in the early planning stage of state and regional transportation programs has been difficult in the United States. There are strong interests within and outside of that project definition process who are deeply vested in traditional outcomes, such as DBB delivery. The very different needs of a design-build or concession project are rarely considered at the critical project inception stage. This creates expensive and time-consuming challenges later on if a P3 approach is eventually chosen.

A different process is used in Canada, the United Kingdom, Spain, Australia and other countries where transportation P3 programs are integrated into the planning process.

For example, in Canada, federal funding rules require that *all* large public works infrastructure projects proposed by provincial or municipal governments seeking federal support undergo a formal analysis of the P3 option. Individual provinces in Canada have taken the next step and created expert agencies to work with governments to plan and execute P3 projects. Thus far, they have successfully completed about 150 P3 projects, though not all have been transportation projects.

In the U.S., P3 projects are highly negotiated to win local support and then contracts must be further crafted to meet the demands of investors. The success in financing several signature P3 projects over the past few years shows a way forward. But each jurisdiction is different and requires individual approaches, which defeats most efforts to standardize procurement methods and contract documents.

Financial Challenges

Effects of the financial crisis

Financing large, complex P3 concessions doesn't just involve toll revenue forecasting risks. These P3s also include uncertainty about the balance-sheet strength and the commitment of all the stakeholders—individually and corporate—in the transaction. These are mainly contractors, operating companies and equity funds. All were affected by the global credit crisis of 2008. Balance sheet recovery is underway but there still is uncertainty about the strength of some lenders and borrowers.

For the past 20 years, the principal debt providers in transportation P3s have been European banks, mainly those with close relationships with project developers. But in their current condition, these commercial banks are reducing their exposure to projects with traffic risk. They have shortened loan terms, increased spreads and financed only select projects. Higher capital charges and liquidity buffers being phased in under Basel III may make P3 projects even less attractive to banks.

Before the crisis, monoline insurers were the major force in analyzing, insuring and monitoring a transportation P3 project debt for bond investors. But most went bankrupt under the weight of their mortgage insurance losses. Bond-rating agencies survived a regulatory threat but do not perform the same level of credit analysis that the monolines did.

The monoline bond insurer's role for P3s was not only to raise the rating and lower the costs of debt. They also conducted due diligence, negotiated terms and conditions, and performed surveillance during and after construction of P3s on behalf of the bondholders.

A big question for P3s now is who can step into this position and lead what many times is a protracted and complex process of due diligence, documentation and negotiations for a large group of bondholders?

The most likely candidates would be U.S. public pension funds or insurance companies.

So far, however, these sophisticated investors have allocated very little investment capital to public works infrastructure. Only one U.S. fund, the Dallas Police and Fire Transportation Pension System, has made a direct investment in a U.S. transportation P3.

One reason is that the big financial institutions studying the U.S. market almost universally seek to invest in mature assets with proven cash flows, such as the toll networks owned by states and public turnpike authorities. Greenfield urban expressways and other P3s without proven cash flows and other types of investments involving construction and traffic-forecasting risks in most cases do not meet their requirements.

Individual transportation P3 projects will continue to obtain financing, with considerable help from state governments and federal support from TIFIA and PABs. But the portion of the capital needs that can be met with demand-risk financing is less than it was before the credit crisis.

Political challenges

Lack of enabling legislation

Only slightly more than half the state legislatures in the U.S. have enacted P3 enabling legislation, in spite of years of encouragement from the federal government and private developers. To address this inaction, ARTBA's P3 Division has partnered with the National Council of State Legislatures (NCSL) to produce a "P3 Toolkit" to help elected officials assess P3 benefits as well as public policy concerns. ARTBA seed-funded the toolkit and is working with NCSL to present it to state legislatures without P3 laws.

Reasons why states don't pass P3 laws vary widely. Among them are:

- Voter opposition to tolls
- The limited applicability of toll financing in rural states
- Concern about the extensive foreign involvement in the development, financing and operation of P3 projects
- Trade union concern about private control of contracting and prevailing wages
- Public employee union concern about delegating the design work done by union members to P3 developers (a major obstacle in California and New York)
- Fears of local contractors that they will be out-maneuvered in contracting negotiations with the private developers leading P3s and
- Concern by consulting engineers that their powerful leadership role as the designers of state DOT projects will be usurped.

Governors generally are more often supportive of the P3 concept than legislators, so a governor's political leadership is often the key to gaining passage of enabling laws. Steadily diminishing state highway budgets (28 states reduced budgets in 2010) are helping to bring the various state and local interests together now to seek ways to leverage scarce public funds using P3 approaches.

Process challenges

Existing institutions, customs and laws that reinforce the traditional project delivery methods and the public funding and financing of transportation infrastructure are deeply ingrained. These include:

Planning assumptions

In many U.S. highway departments, design-bid-build delivery is assumed at the project inception stage with no consideration of alternatives at that point. As a result, most of the existing P3s projects started as DBBs and had to be retooled later on. A few U.S. agencies, Los Angeles Metro, Texas DOT and Georgia DOT among them, have begun to evaluate P3 delivery in a programmatic way early in the planning process. The goal is to optimize the chosen procurement approach from that point on to get the best price and life-cycle result. More government transportation agencies will have to follow their lead for deal flow to substantially increase.

The high price of delay

The P3 development process for some transportation projects is too long, which creates considerable political risk as new governors and legislatures may have to buy into complex P3 projects they didn't initiate. Even if projects survive the political challenge, the long development process exacts a high price.

A recent case of this is found in the I-495/95 HOT lanes project in Virginia, which started with an unsolicited proposal that was welcomed by the Virginia DOT in 2003. The first phase started construction in 2008 and the second—extending HOT lanes south on I-95—may reach financial close in 2012 or 2013.

The original private proposal for I-95 was for 56 miles of HOT lanes, an up-front concession fee of $250 million with revenue-sharing and subsidies for bus rapid transit and park-and-ride lots. The renegotiated plan will be substantially scoped back, in part due to changed capital market conditions. The private activity bonds (PABs) issued for "phase one" carried an interest rate of about 5 percent. The same PABs would have an interest rate of about 8 percent now.

Project Development Agreements

The greatest benefits of P3s come when the private partner is engaged early in the development process, as the environmental studies largely define the scope of work. Yet it has been difficult to design a procurement approach in the U.S. that encourages that to happen.

Irrational NEPA

There is a need to reconsider the National Environmental Policy Act (NEPA). The process that has evolved is bogged down in paperwork, procedure and process so that the goal of sustainable, environmentally sound projects has been largely lost. The best collective judgment of experts about what should be done is not what gets done.

(EDITOR'S NOTE: About 20 states have established habitat conservation authorities that identify large tracts of prime habitat and systematically require builders to add to that conservation area when they take environmentally sensitive land for right-of-way. The swaps allow builders to meet mitigation requirements and avoid permitting delays and litigation. This approach should be supported in the next highway reauthorization.)

Bottom-up governance

There is a substantial administrative burden placed on transportation P3s in the United States. In Europe, contract forms are standardized (such as SOPC 4 in the United Kingdom) and procurement processes are set by European Commission's procurement rules and procedures. In the U.S., there are 50 different state regimes and rules and as many or more regional transportation agencies that govern the critical details of project development.

Inexperience

Absent allies

Municipal bond bankers have a unique understanding of local politics and project planning processes but have not played a large role in P3s that involve private equity. Largely because they can make more money underwriting tax-exempt bonds, no U.S. banks have dedicated the resources needed to participate in P3 projects. One formed a P3 project finance group in the 1990s, but, ultimately, did not pursue the business.

Balance sheet risk

Surety companies in the U.S. generally assess the full value of a P3 project against 1) the design-builder's bonding cost for a specific project and 2) the contractor's overall company bonding limit. That means U.S. companies can't contract for a multi-billion dollar transportation improvement project without having a large balance sheet to support the bond—individually, few U.S. contractors do. Also, P3s produce negative P&Ls during the early years, further limiting the role of many U.S. contractors as developers, especially publicly-traded companies.

European dominance

U.S. state and local governments have focused on P3s with private finance largely for development of new highway capacity. The response to that demand has come from large international developers. These companies combine design-build capabilities with long-term banking relationships, toll collections experience and operations and asset management knowhow under one roof.
Opposition to this foreign influence in P3s has been dealt with through public education, the Americanization of these firms through U.S. acquisitions, and the job creation benefits of new investment.

In the Dallas Metroplex, for example, Spanish P3 developer, Cintra Concessions, estimates that seven percent of the regional employment stems from design-build and concessions projects worth $8 billion that have been started in the region since 2008.

The American construction industry is filling important roles in P3s. U.S. engineering firms provide many of the design innovations that reduce P3 project costs. Two U.S. firms provide contract road maintenance and

asset management services to state DOTs, though that market is dominated by a large, publicly-traded Australian firm.

About a dozen large U.S. contractors have developed design-build expertise for large projects, but few have shown interest in investing in high-risk P3 concessions that involve traffic forecasting risk and long-term operations and maintenance.

Only three U.S. contractors are participating as investors in highway concessions—Fluor Corp., Zachry Construction, and recently, The Lane Construction Corp. These firms typically have a limited role as owners and are involved mainly to secure some portion of the construction work at favorable prices.

In the largest example, in 2002, Fluor took an unsolicited proposal to the Virginia Department of Transportation to convert HOV lanes into HOT lanes in the median of I-495. Toll road owner-operator Transurban of Australia joined Fluor as an equity investor two years later. Fluor took a 10 percent interest in the concession, Transurban, 90 percent. As a follow-on, Fluor is in a joint venture with The Lane Construction Corp. on the $1.4-billion design-build contract for the project.

After years of growth fueled, in part, by European Union equalization payments, Spanish builders began moving 10 years ago to secure new markets outside of Spain to offset a slowdown in their home market.

Europe's strongest builders, Vinci (France), Skanska (Sweden), Hochtief (Germany), Laing (United Kingdom) and others followed them to Eastern Europe, South America, Canada and the U.S. A common asset of all these firms is a strong balance sheet with which to pursue large projects.

Two of Spain's largest contractors—Ferrovial and the ACS Group—have aggressively pursued U.S. P3 concessions as a means of both penetrating the North American construction market and developing and operating long-term assets in the U.S. and Canada.

Ferrovial's Cintra Concessions moved first and won a 99-year lease in 1999 for Toronto's Highway 407 toll road, which has become the most lucrative P3 highway concession in the world. Ferrovial's biggest P3 competitor, ACS Group, is acquiring debt-free Hochtief now. When completed, the acquisition will make ACS the world's largest infrastructure developer and design-build contractor.

The Future of Transportation P3s in the U.S.

At this point in time, the pace of future P3 growth in the U.S. depends on many things. Three over-arching issues are:

- Reluctant public acceptance of private involvement,
- The slow pace of P3 project development at the state and local level, and
- A lack of political leadership on the need for new revenue sources—tolls or fuel taxes—to pay for needed projects.

Opposition to tolls undermines many P3 projects, especially proposals to toll existing highways—especially in order to rebuild and modernize them for the next generation of users. There is a growing call, for instance, and convincing policy support for tolling the Interstate Highway System to raise funds for rebuilding the 50-year-old asset. There has never been public support for Interstate tolling at the state level, however, and each state owns its segment of the system. One recent suggestion is for the federal government to incentivize tolling by providing an 80 percent federal match for toll road construction vs. a 50 percent match for freeways. A national program to toll and rebuild the Interstates would revolutionize the P3 market, but it is not yet on the horizon in the U.S.

P3s are created by state, regional and local governments to meet a specific transportation need. There are many variables that determine the success or failure of each project. To align public and private interests under a long-term contract requires project-specific tradeoffs that must be negotiated at the local level in the U.S. system of government.

For that reason, the federal government can do little immediately to induce P3 development except for increasing financing support. Expanding TIFIA, removing the volume cap on PABs and providing other incentives for private investment would bring needed expertise and financial energy to the infrastructure market, enhancing deal flow.

Federal Incentives for P3s

Over the past 22 years, the Congress and the federal government have proactively supported development and implementation of public-private partnerships to finance and build transportation projects in many significant ways. These include:

- A statutory framework that allows the use of federal funds on P3 projects
- Two pilot programs. The first, from the 1998 federal surface transportation authorization law, permits toll finance to reconstruct three existing Interstates. The second, from the 2005 law, SAFETEA-LU, permits toll finance to pay for three new Interstates;
- Encouraging the establishment of state infrastructure banks
- Providing substantive assistance from the Federal Highway Administration's (FHWA) Office of Innovative Program Delivery
- FHWA's SEP-15 program to promote new P3 approaches to project delivery;
- Private Activity Bonds; and the

- Transportation Infrastructure Finance & Innovation Act (TIFIA) federal credit assistance program.

The most effective way for the Federal government to stimulate private investment in surface transportation infrastructure is to expand existing federal credit assistance and tax code incentives. These two policy tools share some common features:

- Project sponsors must identify and substantiate revenue streams to support repayment, addressing the primary impediment nationwide to further capital investment

- Both credit assistance and tax incentives draw upon market discipline to ensure the proposed projects are financially sound

- Credit and tax measures can be applied to both publicly managed projects and P3's; and

- There is a much smaller budgetary cost for credit and tax subsidies than for grants, enhancing the feasibility of any proposed infrastructure policy initiative.

Two principal programs in effect now are USDOT's TIFIA loan program and tax-exempt Private Activity Bonds (PABs).

"Transportation Infrastructure Finance & Innovation Act" (TIFIA)

Established in 1998, TIFIA offers credit assistance for highway, transit, intercity passenger facilities, freight rail and freight transfer facilities. Under TIFIA, USDOT helps project sponsors assemble capital by providing long term, "patient" financial assistance (loans, loan guarantees and letters of credit) for projects of national and regional significance in excess of $50 million that have dedicated revenue sources available for repayment.

Since 1998, the USDOT has provided financial assistance in excess of $8 billion, supporting 22 projects, both P3 and publicly developed assets, with a total capital value in excess of $30 billion for less than $1 billion in budget authority.

Because the budgetary cost (sometimes called the subsidy cost) of a TIFIA loan is not its face value, but rather the combined cost of issuing the loan and the default risk, the budgetary cost to the Highway Trust Fund or its "score," is typically about 10 percent of the face value of the credit.

A leading example of use of this financing tool is the Texas Department of Transportation's North Tarrant Express. This public-private partnership was created to design, build, finance and operate managed lanes and upgrade existing facilities within an existing 13-mile Interstate highway corridor in the congested Dallas-Ft. Worth Metro area.

Under construction today, the project's $2 billion in capital costs were financed with $573 million in state funds, $400 million in senior private activity bonds, a $650 million TIFIA loan and $427 million of private equity. Thus the approximately $65 million in budgetary cost for the TIFIA loan, essential to the assembly of the other monies, helped deliver a $2-billion project, yielding a federal cost-to-project value ratio of approximately 3.5 to 100.

Additionally, the operating and maintenance costs of the managed and general purpose lanes of the North Tarrant Express facility are privately funded for 50 years without any state or federal government assistance.

TIFIA loans have played a pivotal role in the financing of eight P3 concession projects in four states with a combined value of $14 billion (www.fhwa.dot.gov/ipd/tifia/). Yet TIFIA's future role is limited by funding constraints—it annual budget authority is $122 million—and by its small staff within USDOT. Six federal employees are involved in lending activities, assisted by financial and legal advisors. TIFIA's administrative budget since 2005 has been $2.2 million a year.

The current demand for TIFIA loans from both private and public sector project sponsors far exceeds the administrative and financial capabilities of the program. Of 39 projects submitting letters of interest for TIFIA loans during 2010, only four were invited to continue the process and apply for FY 2011 assistance. Almost $35 billion of projects were passed over.

A new solicitation in March 2011 for letters of interest resulted in 34 public and P3 projects worth $48 billion seeking $14 billion in TIFIA loans and credit support. To meet that demand would require a loan subsidy budget of about $1.4 billion, almost 13 times the $110 million that is actually available for loans.

In addition to funding constraints, policy and bureaucratic issues also seem to be hindering the program. The American Recovery and Reinvestment Act of 2009 (ARRA or TIGER l) permitted the USDOT to fund up to $250 million in TIFIA credit subsidy, but only $60 million was used. The FY 2010 Appropriations Act (TIGER ll) program permitted up to $150 million in credit subsidy, and, despite excellent applications, only $20 million was used by USDOT.

Recognizing those constraints, President Obama's budget proposal for FY 2012 includes $450 million for TIFIA, a nearly fourfold increase in the current authorization. The Administration's budget plan would eventually fold TIFIA into the proposed National Infrastructure Bank, which would award both grants and loans through a revolving-loan fund.

Private Activity Bonds (PABs)

A demonstration program authorized in 2006 allows $15 billion worth of PABs to be issued for P3 projects. So far, they have been used as part of the capital structure on three P3 concessions. In 2008, $589 million in PABs were issued as part of the $1.9-billion raised to build the I-495 HOT (high-occupancy toll) lanes project on the Capital Beltway in northern Virginia (see Appendix: "Lessons Learned for State DOT Leaders"). This project was originally proposed and developed solely by Fluor. Transurban was later brought into the project as a 50/50 development partner upon award. The placement of the bonds was done by the development team, which was branded Fluor-Transurban.

In Texas, the capital structure for two managed lanes projects financed in 2009 and 2010 in the Dallas/Fort Worth Metroplex included over $1 billion in PABs. In total, almost $3.5 billion in financing was raised for the North Tarrant Express (NTE) project and LBJ Freeway by co-investors Cintra Concessions and Meridiam Infrastructure.

(NOTE: These are exceptionally strong projects that were financed in the difficult post-crisis credit market without obtaining bond insurance on the PABs. NTE and LBJ also mark the first time that a pension fund has been a direct equity investor in a P3 toll project in the U.S. The Dallas Police and Fire Pension System has a 10 percent (NTE) and 6.6 percent (LBJ) share of the ownership in the project companies, together with Cintra Concessions (56.7 percent and 51 percent) and Meridiam Infrastructure (33.3 percent and 42.4 percent).

National Infrastructure Bank (iBank)

Establishing a U.S. national infrastructure bank (iBank) modeled on the TIFIA program but also including grants could draw more capital into transportation infrastructure development, both public and private. The

Obama Administration's current plan is to establish the bank in the surface transportation reauthorization bill, which could come as early as this fall. Two other iBank proposals are be considered in Congress.

The Administration's fiscal 2012 budget includes this description: "This bank would leverage private and state and local capital to invest in projects that are most critical to our economic progress. This marks an important departure from the federal government's traditional way of spending on infrastructure through earmarks and formula-based grants that are allocated more by geography and politics than demonstrated value. Instead, the Bank will base its investment decisions on clear analytical measures of performance, competing projects against each other to determine which will produce the greatest return for American taxpayers."

The White House budget substantially increases TIFIA funding and commits $405 million to direct loans in FY 2012. At current leverage rates that would mean about $12 billion worth of projects could be put under construction. TIFIA's small office would be absorbed into the new National Infrastructure Bank in fiscal year 2013 and further expanded there. The Infrastructure Bank would obligate about $2.2 billion in grants in fiscal 2012 and commit $200 million to direct loans, according to the budget, which *calls for an iBank staff of about 100*.

There are considerable hurdles to the creation of a potentially powerful bank with grant-making power that takes decisions about project funding away from Congress. Which congressional committees would have jurisdiction is an issue. Whether the bank would be located in USDOT, some other executive agency or stand alone as a new government-sponsored enterprise is still under discussion.

In addition, for the Infrastructure Bank to attract co-lenders and function efficiently, P3 procurements and contract structures may have to be made more uniform, removing some flexibility from locally negotiated arrangements.

Timing is the most important issue. The economic crisis has left governments needing innovative strategies for their capital plans right now. Incentives need to be put in place to bring new investors into the market. While the proposed iBank is intended to address some of these needs, it won't begin operations for a few years, if at all. For the P3 market to grow, more efficient funding options are needed now.

(NOTE: Rep. Rosa L. DeLauro (D-CT.) has proposed modeling an iBank on the European Investment Bank (EIB), which manages a 325 billion Euros (U.S. $475 billion) portfolio and made Euro 79 billion (U.S. $115 billion) loans in 2009 *with a staff of 2,000—including 600 loan officers and 250 engineers.* Annual salaries for 100 or so top EIB officials range around 240,000 Euros (U.S. $350,000).

After 53 years of operation, the average period from an EIB member country's loan application to financial close for large projects is 2 1/2 to 3 years. Euro 43 billion in transport loans were made between 2005 and 2009 covering no more than 25 percent of the cost of high-speed rail, trans-European highways and other projects. The Bank's current policy priorities are clean energy, small and medium businesses and climate change. Water and sanitation, schools, hospitals and other public facilities are also financed.)

P3 Centers of Expertise

Traditionally, P3 procurements have been run by state departments of transportation, driven primarily by the fact that most early P3s involved highway assets. As a result, state legislatures gave highway departments the legal authority to engage in highly complicated technical procurements, procurements in which they had no experience. This has resulted in long procurement times and complicated transactions.

In 2009, Puerto Rico departed from this tradition by incorporating a P3 Authority as a central part of the island's procurement process. Instead of just focusing on highways or trying to build or concession one project, this authority is responsible for all P3s the government pursues. It has begun P3 procurements to monetize a toll road and airport, and has plans to deliver new water infrastructure and reform billing practices, and build or rehabilitate 100 schools.

The Puerto Rico P3 Authority is staffed with bankers and lawyers familiar with nontraditional procurements and able to focus just on the complexities of P3 procurements. Other states are considering similar approaches to P3s. The Virginia DOT is forming a special P3 office to help expedite transportation projects.

D.J. Gribbin, president of ARTBA's Public Private Partnerships Division, has proposed creation of a federal "Partnerships USA" to pool best practices in P3s, create model procurement documents and concession agreements, provide assistance in performing public-sector comparator analysis, perform studies to analyze the true benefits of P3s, and be an unbiased source of information for the public.

The European Investment Bank operates such a European P3 Center of Expertise to assist its 27 European member states in preparing loan applications. Procurement approaches are relatively standardized in Europe but laws, languages and political conditions are different in each of the states, which could make EIB's experience applicable to the U.S.

Conclusions

The United States has a comprehensive and relatively mature transportation infrastructure network in place. As a result, about 85 percent of the total public capital investment in the nation's transportation system in recent years is directed toward maintaining and repairing it, not constructing new facilities or adding capacity to existing ones.

Two decades of experience have shown that private investment is attracted to large, complex transportation projects that add new capacity to the U.S. system and can be supported by a new revenue stream, usually tolling. Thus, the market share for P3 projects in the overall U.S. transportation construction market has been—and likely will remain—fairly small, less than five percent per year.

The value of this contribution, however, should not be underestimated. For absent significant increases in public funding, P3s will likely be the primary model for building new highway capacity in heavily congested urban areas in the decades ahead.

Given the economic and social toll caused by traffic congestion in the U.S. and the enormous unmet demand for new highway capacity to facilitate freight movement in an increasingly competitive international market, P3 projects should be aggressively encouraged and supported.

Increased deal flow would bring considerably more expertise to bear on project creation, development and financing. The federal role in that effort should be to expand TIFIA and PABs and to add new incentives to make infrastructure debt attractive to pension funds, insurance companies and other patient investors. That could include, among other things, taxable "Build America Bonds," "Qualified Transportation Improvement Bonds" and a taxable, inflation-linked security aimed specifically at infrastructure investment.

After many years of trial and error, P3s are making a substantial contribution to investment in new expressway capacity in the U.S. For P3's contribution to grow, a continuation of the commitment from government, industry associations like ARTBA, and the private sector will be required.

Appendix I

Why Are There So Few U.S. P3 Projects?

Raymond Tillman, former president of the Public Private Partnership Division of the American Road and Transportation Builders Association (ARTBA), offers the following observations:

Toll road developers

A broad range of experience, capabilities and relationships are needed to be successful in this role, along with a willingness to take calculated risks, provide large amounts of up-front risk capital, and wait many years for a financial return on investment. They also must have pre-established relationships with many of the parties noted below. *The foregoing does not describe many American enterprises or business-culture attributes.*

Debt financing providers

Except for revenue bonds with good coverage, *debt financing for transportation projects is often considered overly risky by American banks and underwriters since they have limited or no experience with P3 structures or even DBOM's*. European banks understand P3's, and often have long-standing relationships with major concessionaires. Many European lenders, however, are reducing their exposure to traffic forecasting risk which will affect the pace of new project financings.

Equity financing providers

Equity financing of transportation projects is relatively new to the few American hedge and pension funds now in this field. Funds generally are still far down the learning curve both with respect to financial techniques and business attitudes. *Most American investors are not used to, or interested in, supplying "patient" long-term capital.*

Toll road operators

Cost-effective (low cost but reliable) toll road operators are crucial to a competitive P3 bid. US toll road operations were virtually always the responsibility of public agencies with union labor and thus little private sector skill or management ability was developed and available for a serious P3 bid. European and Australian operators are experienced and cost effective.

Life-cycle costing

Toll road planning, design, construction and operations must consider and minimize life-cycle costs. The traditional American design-bid-build procurement does not focus on this, and thus the American toll road infrastructure industry is not as experienced as others in this area. European engineers were "brought up" with life-cycle design features and costing.

State legislatures, governors, and agencies

Only slightly more than half the state legislatures in the United States have enacted P3 enabling legislation, in spite of federal, private sector and institutional urgings. Considering the demonstrated benefits of a properly conceived P3 project to all parties, this is a clear indication that legislators and their staffs are often unaware of these benefits, are unwilling to take political positions where they think they could be criticized, and will not exercise leadership in this area. This may be changing because of increasingly constrained infrastructure funding from traditional sources but is happening only slowly.

Governors are more often supportive of the P3 concept, but dependent on legislative support. Few appear willing to use "political chips" or influence, though this also may be slowly changing. Agencies frequently have a vested interest in the status quo and maintaining their job responsibilities. The most notable example of this may be the legal actions brought by the California state unions to obstruct and prevent P3s from being implemented.

P3 financial structure constraints

There is often a paucity of clearly financially viable projects, particularly in areas that are not experiencing relatively high growth rates. Government loans and grants (i.e., TIFIA), senior and subordinated debt, various categories of equity, and a range of other financial structuring techniques and terms may then be required. This involves a high level of financial skill, the cooperation of government agencies and a very experienced P3 team.

Lengthy project development and implementation process

In the United States, the amount of concept and alternative studies, environmental statements, approval procedures, design reviews, public outreach programs, and political maneuvering can be time-consuming and very expensive. Many projects fail to make it through this process, and many potential participants are thus discouraged from trying. While the activities leading to final approvals can be considered a proper government expense, it is often placed on developer teams, with substantial financial exposure.

Miscellaneous controversies

These can include: litigation brought by affected landholders or others; local contractors being forced to work for major contractors at reduced margins; labor unions not receiving their normal protective provisions; environmental groups in opposition to the project; and the public at large objecting to contractually mandated toll increases, as well as many others.

Public agency versus private sector capabilities

This underlies many P3 discussions and debates. Public agencies and their staffs are non-profit, but often limited in experience pertinent to a P3 project and its special demands. They often are bound to union work rules and job security rather than being models of efficiency. A major consideration is their ability to obtain tax-exempt financing.

Private sector developer teams have substantially more pertinent experience from other projects, often worldwide, and must emphasize performance in their staffing and the development, structuring, construction and operation of a P3 project for it to be successful.

Appendix II

Transportation P3 Contractual Provisions

Throughout the term of a transportation P3 project, the government owns the land and the road itself. The private sector simply leases the roadway and earns the right to collect tolls in exchange for meeting the state's requirements as set forth in the concession agreement. These agreements form the basis of a long-term partnership and allow the state to do what it does best (environmental permitting, contract oversight) and the private sector to deliver those services where it adds the greatest value (design, finance, construction, operation, maintenance, marketing and customer service).

The following are six common transportation P3 contract provisions:

Toll Rates

In general, concession agreements in the United States limit the ability of the private sector to raise toll rates. Most concession agreements incorporate state imposed annual caps on the amount toll rates can be increased, using various inflation indices to establish allowable increases. It should be noted, these caps are ceilings and the actual rates a company charge may well be lower and are primarily a function of market conditions. Because there is elasticity of demand on toll roads, particularly in recessions, the private sector is careful not to set rates so high that they will disproportionately affect demand for the roadway.

Buyback Provisions

Most transportation P3s permits the public sponsor the right to "buy back" the lease at any time from the private developer. There are no conditions on the state's ability to terminate the lease and it may be done so for convenience at any time.

Operations and Maintenance Requirements

The service requirements established by the state for privately operated toll roads are usually significantly higher than those of state-run roads. These service requirements run the gamut from the time within which dead animals must be removed from the roadway to the requirement to add additional lanes if the level of service on the roadway falls below a certain level. If the developer fails to meet these requirements it may be deemed in breach of the terms of the agreement. This violation could potentially force the private entity to return the road to the state at a significant loss.

As a result, negotiated terms with both debt and equity partners require that both routine and major maintenance expenses are considered senior to all other expenses of the project except day-to-day operations. The project is thus ensured to consistently meet and exceed the minimum levels of service.

Furthermore, as toll roads often are in direct competition with non-tolled alternatives, private developers strive to consistently exceed the required levels of service in order to provide a more valuable experience for customers. One example of this includes the implementation of open-road tolling which reduces congestion by allowing customers to pay their tolls without stopping.

Hand-Back Reserve and Requirements

Another provision inherent to most concession agreements is the requirement that the developer hand back the project in a pre-defined state of good repair and fund a hand-back reserve to account for future costs of the project after its return to the state. On the SH 130 toll concession between San Antonio and Austin, Texas, the hand-back reserve is structured as quarterly deposits for the last six years of the concession in an amount based on the remaining useful life of major project components. This reserve is to be used for renewal work on the facility to ensure it is returned to the state as a fully operational and valuable facility. Upon termination of the lease, any remaining money in the fund becomes the property of the state.

Competing Infrastructure

Concession agreements allow the public sector to make virtually any improvement to surrounding roadways. In turn, the state acknowledges that the developer makes large investments in public infrastructure based on certain conditions at the time of the investment. Therefore, the state agrees to compensate developers for certain improvements to surrounding roadways that cause a material impact to the finances of the project. However, the improvements that trigger this compensation requirement are usually very limited in scope.

First, they are limited to a franchise zone close to the project.

Second, improvements that do not cause material negative impacts to the concession do not require developer compensation.

Third, developers are not compensated for public development of any projects included in existing short, medium and long-term state transportation plans, for improvements to nearby facilities due to their reaching certain congestion levels, or for safety improvements.

Taken together, these provisions maintain the state's ability to improve and support infrastructure regardless of the existence of a privately operated toll road in the area.

Right-of-Way and Eminent Domain

In P3s, private developers do not own the land or the facility constructed on the land. The public sponsor is the record titleholder to all land acquired for the development. The right-of-way is acquired in accordance with Federal and State law and, when required, through the eminent domain process. The public sponsor oversees the entire land acquisition process and its approval is needed in almost any step. The private developer does not obtain nor request any rights to any excess land for commercial development.

Appendix III

Lessons Learned on the Capital Beltway HOT Lanes Project in Northern Virginia

One of the largest transportation P3s in the United States started with an unsolicited proposal in 2002 from Fluor Enterprises to the Virginia Department of Transportation (VDOT). The proposal aimed to convert High Occupancy Vehicle (HOV) lanes into High Occupancy/Toll (HOT) lanes in the median of the I-495 Capital Beltway in Fairfax County, Virginia. Australia-based toll road owner-operator Transurban joined Fluor's design-build team two years later and they started construction of the 14-mile, 2x2-lane toll road in 2008. Their partnership with VDOT has resulted in private development of the most significant improvements to the I-495 Beltway in a generation.

Work underway now includes construction of:

- A 14-mile toll road with eight untolled general purpose lanes and four HOT lanes in the median
- Upgrades to bridges and overpasses and 12 key interchanges.

The major benefits of the project will be:

- Improved safety for motorists
- A congestion-free alternative for untolled carpools, vanpools, bus rapid transit and toll-paying non-HOV motorists.

The $1.9-billion project was financed with a federal TIFIA loan, "Private Activity Bonds" (PABs), $409 million in state grants and $350 million in private equity. As of April 2011, work is about half done and on schedule for completion in 2013.

Lessons for State DOT Leaders

Pierce Homer, former Virginia secretary of transportation (2005 -2010), presented the following "lessons learned" on the I-495 Capital Beltway P3 to advocacy groups meeting in Phoenix, Arizona:

- **Allow unsolicited proposals**

  The competition of ideas is as important as price competition.

  To expand capacity on a heavily congested segment of the I-495 Beltway in Virginia, a decade of public-sector planning had produced an unworkable plan in 2002. The state proposed to add two lanes in either direction and rebuild every interchange according to traditional standards. Public opinion was overwhelmingly negative and the cost of acquiring 400 homes and businesses was "astronomical."

In the middle of the public debate, partners Fluor and Transurban submitted an unsolicited proposal for a radically different idea: do the best you can within existing right of way, and price any new capacity added using high occupancy toll lanes (HOT). After detailed review to ensure competitive pricing, that is the project being built today.

Main point: be very careful about ruling out ideas from the private sector. One of the best ways to do that is seek unsolicited proposals early in the project development process. The traditional planning process tries to make everybody happy, and may not result in commercially viable projects.

- **Test commercial ideas directly in the environmental process**

  We must find a way to incorporate commercial thinking into the NEPA process.

  No one has figured out how to do that, but it's ultimately the right way to get the best project—one that's environmentally sound and commercially viable. If you wait until you've gone through a traditional public-sector planning process, you may have something that's not commercially viable.

- **Build in-house staff capabilities**

  State DOTs must rebuild their in-house capability to manage big projects.

  The transportation industry is increasingly beholden to consultants because of the loss of technical expertise in the public sector. Ultimately, the public owner has to make program- and project-level decisions, and the public sector needs the experience and ability to make those decisions. If you're relying on consultants to do that, you're not living up to your responsibility.

  In highly complex P3s, you get a lot of consultants' recommendations but no decisions because public administrators are unable, or even afraid, to make decisions. Experience matters.

- **Identify key public benefits to protect or advance**

  We shouldn't be getting into public-private partnerships unless there are specific public benefits to be achieved.

  For Virginia, we were willing to give a lot to bring HOV and bus rapid transit to the busiest corridor in Virginia. Compromises were made on capping free HOV use in order to make the project feasible as a P3. We were willing to make that tradeoff in order to achieve the public good.

  That's a very difficult attitude to instill in a public bureaucracy, and even more difficult to instill in the public, because it is very difficult to explain to the public.

- **Track financial trends**

  The financing of P3 projects relies on small movements in interest-rate spreads and intimate knowledge of the debt markets.

  It's important for public officials to understand this process and track the data closely. Public sector financing tends to move more slowly, and the public sector needs to understand how sensitive the private financial sector is too small, daily changes in conditions.

- **Use flexibility of design-build to address local and community concerns**

  You need a design-build contract that's flexible enough to allow for adding and subtracting scope without a battle.

  P3 projects tend to be large and you can miss things. On I-495, it was sound walls. It was a $40-million addition to a $2 billion program, and well worth it. This has been a remarkably smooth and popular project, mostly because of the sound wall additions.