



Federal Barriers to Private Capital Investment in U.S. Infrastructure

by Robert W. Poole, Jr. and Austill Stuart



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Executive Summary

The incoming Trump administration has proposed a \$1 trillion program to foster private investment in aging public-sector infrastructure. Eligible projects would involve infrastructure that has, or could have, robust user-fee revenue streams. Large-scale public-private partnerships (P3s) would finance, redesign, rebuild and modernize, operate and maintain aging and/or under-sized airport, highway, seaport, water-supply and waste-treatment facilities. These projects would be financed via equity investment (20% to 30%) and long-term revenue bond financing (70% to 80%).

Global infrastructure investment funds, U.S investment banks and large pension funds are eager to invest in such P3 projects in the United States. But to date, the opportunities to do such projects have been far greater in Asia, Australia, Canada, Europe and Latin America than here in the land of free enterprise. Part of this is due to the institutional inertia of many state and local governments that are slow to adopt new ways of doing business. But another major factor is federal obstacles to this kind of private capital investment in state and local infrastructure.

There is no lack of candidate projects. Those considered in this report include:

- 130 large, medium and small-hub airports;
- 44,000 miles of non-tolled Interstate highways nearing or exceeding their 50-year design lives;
- Over 2,000 municipal electric and gas utilities;
- 99 seaports;
- 56,000 municipal water systems; and
- 15,000 wastewater treatment facilities.

All of these already have bondable user-fee revenue streams or (in the case of Interstates) could implement such fees (state-of-the-art all-electronic tolling).

Infrastructure that is already owned by investors—most electric and gas utilities and the occasional P3 airport (San Juan) or toll road (Indiana Toll Road)—already has access to private capital and is being rebuilt and modernized. It is *public-sector* infrastructure that suffers from large-scale investment shortfalls.

Worldwide and in a few dozen U.S. revenue-financed P3 projects, an impressive track record has been assembled. Benefits include:

- Major investments much sooner, thanks to ready access to capital;
- A demonstrated track record of largely on-time completion;
- Innovation that reduces costs and/or improves performance;
- Lower life-cycle cost, since projects are designed to be efficiently maintained;
- Transfer of major risks (cost overruns, traffic shortfalls, etc.) from taxpayers to investors; and
- New tax revenues to government (as with investor-owned utilities).

The United States is missing out on these benefits, while much of our infrastructure continues to deteriorate. In transportation alone, the last five years have seen \$160 billion of P3 projects in Canada, Europe, Latin America and the United States. But only 12.5% of that has been in this country. This lack of projects is due in part to federal barriers that make it difficult, financially disadvantageous, or impossible to do such projects here, compared with other countries.

This report identifies the principal federal barriers. Among them are the following:

- A very restricted airport privatization program that erects barriers not found in other countries;
- A federal ban on using toll revenues to finance the reconstruction of aging Interstate highways (except for a tiny pilot program); and
- An OMB rule requiring that if a facility that has received federal aid is privatized, the grant money must be repaid (a *de-facto tax* on reinventing government).

But by far the greatest federal obstacle is the inability in most cases to use tax-exempt revenue bonds for P3 projects. The United States is virtually alone in allowing state and local governments to issue tax-free revenue bonds. This creates a non-level financial playing field since, except for surface transportation projects, P3 projects are limited to using taxable debt. Once interest rates return to normal levels, the difference between taxable and tax-exempt interest rates will be significant. Even for projects that still pencil out with taxable bonds, the user fees will reflect the higher cost of taxable debt financing.

Two policy changes would create a level financial playing field:

1. Generalize the existing surface transportation Private Activity Bond (PAB) program to apply to P3 projects for all categories of public-purpose infrastructure; and
2. Allow the new PABs to be used to acquire and reconstruct existing infrastructure, not just to build new projects.

The second point is critically important, since the primary need is not new infrastructure but the reconstruction and modernization of existing infrastructure.

This program would likely be revenue-positive for the U.S. Treasury for two reasons. First, hardly any public-purpose infrastructure today is being financed by taxable bonds (or in cases where it has been, large fractions of those bonds have been purchased by non-taxable entities such as pension funds). So, a large-scale expansion of infrastructure investment with tax-exempt PABs would not be substituting for non-existent taxable bonds. Second, there would be net new federal tax revenue from (a) corporate tax payments by the P3 companies building and operating the rebuilt facilities, and (b) additional personal income tax payments by a larger pool of construction and maintenance workers, getting premium wages and overtime thanks to the expanded program.

Finally, there would be additional economic benefits over and above the value of the modernized infrastructure. A trillion-dollar P3 infrastructure program would attract global equity investment from the scores of global infrastructure investment funds that are mostly investing in other regions of the world. Also, over time the United States would develop world-class P3 infrastructure developer/operators that would compete in global markets, generating service-export revenues.

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Part 1

Introduction and Overview

The incoming Trump administration has proposed a \$1 trillion program under which private capital would be encouraged to invest in rebuilding aging and inadequate U.S. infrastructure. Candidate projects include airports, highways and bridges, municipal electric and gas utilities, seaports, solid waste facilities, and water and wastewater systems—provided that they have, or can be retrofitted to have, bondable user-fee revenue streams. All these types of infrastructure are owned by state and local governments.

Global infrastructure investment funds, insurance companies and U.S. pension funds are eager to invest in such projects in this country, as they have been doing overseas in recent years. However, a number of federal barriers limit the use of private capital to rebuild and modernize infrastructure that is owned and operated by state and municipal governments if those facilities have received federal grants. This paper identifies the principal barriers, discusses which entity (Administration or Congress) could remove each, and summarizes the potential benefits of a larger role for such public-private partnerships in rebuilding and modernizing aging U.S. infrastructure.

Part 2

Candidate State and Local Government Infrastructure

2.1 What Kinds of Infrastructure, and How Many of Each?

Private investment in infrastructure is best suited to large projects, so this section identifies the primary candidates for such investment. To the extent that major reconstruction and expansion projects can be partially or entirely funded via long-term public-private partnership (P3) agreements, conventional tax-based funding can be refocused on smaller projects that are less suited to P3 modernization.

Commercial Airports

The Federal Aviation Administration sorts airports into five main categories, based on their annual passenger and flight activity. The three groups of interest for P3s are large hubs (30), medium hubs (29), and small hubs (71). Of the 30 large hubs, 11 are owned and operated by cities, six by counties, and seven by states. Of the remaining six large hubs, three are operated by the Port Authority of New York & New Jersey, two by the Metropolitan Washington Airports Authority, and one by the Dallas-Fort Worth International Airport Board. Most medium and small hub airports are owned and operated by city and county governments.

Local officials generally have strong and long-standing interest in political control of their airports. Overseas, where more than 100 large and medium airports have been privatized in the last two decades, many of these airports were owned and operated by the *national* government; that was the case with the first major airport privatizations in 1987, when the UK government privatized the British Airports Authority via a public share offering. While BAA was an example of outright sale, the majority of airport privatizations worldwide have been either partial sales (with governments retaining either a minority or majority stake) or—more commonly—a long-term lease (concession). The former model is more typical of Europe, while the latter has prevailed in Australia and Latin America. Only one U.S. commercial airport is currently privatized under the federal Airport Privatization Pilot Program: San Juan International, which was leased for 40 years in 2013. The consortium that won the bidding has made major investments to modernize the airport's formerly shabby terminals.

Another model is a long-term concession to reconstruct and modernize an airport terminal or to construct an additional one. This model has proliferated in Latin America and the Caribbean. It has been used to a limited extent in the United States, with the most notable recent example being the current \$4 billion project under which a private consortium is replacing the outdated and undersized Central Terminal at LaGuardia Airport and will operate it for 36 years.

Electric Utilities

Although the 2,013 municipal electric utilities in the United States greatly outnumber the 189 investor-owned utilities (IOUs), nearly 70% of all electricity customers in the United States receive power generated by an IOU, according to the American Public Power Association.¹ Government-owned utilities only generate about 10% of U.S. electric power, with IOUs and “power marketers,” which trade shares of electricity generation from various entities, each providing close to 40% generation.²

While most IOUs are run by publicly traded companies, some of these entities have been taken private in recent years. For example, in 2016 Louisiana legislators approved a \$4.9 billion deal under which a consortium led by Macquarie Infrastructure & Real Assets bought the IOU power company CLECO, which serves close to 300,000 customers in that state.³

Gas Utilities

As with electricity, IOUs play a large role in the market for natural gas. According to the American Gas Association, of the 8,218 trillion BTUs sold by the gas industry in 2014, IOUs provided 78% of the total, while municipal utilities only provided 9%, and pipeline entities provided 12%.⁴ IOUs also serve 93% of all natural gas customers, with municipal entities providing the bulk of the remaining 7%.

Interstate Highways and Bridges

The most important highway infrastructure is the aging Interstate highway system. Though encompassing only 2.5% of the nation’s lane-miles of highway, it handles 25% of all vehicle-miles of travel. Begun in the late 1950s, with a 50-year design life if properly maintained, nearly the entire system needs reconstruction over the next two decades, and many corridors (especially those with high and growing truck traffic) need additional lanes. Moreover, at least 100 urban interchanges in the system are functionally obsolete and serve as major bottlenecks; they need replacement with more-modern designs.

¹ American Public Power Association, “U.S. Electric Utility Statistics,” 2015–2016 Annual Directory & Statistical Report, 2016. <www.goo.gl/5V8Xxk>

² Ibid.

³ Mark Ballard, “LA Regulators Vote to Allow the Sale of Cleco for \$4.9 Billion,” *Baton Rouge Advocate*, March 29, 2016. Web.

⁴ American Gas Association. *Annual Statistics*. Table 6-10: Gas Industry Sales by Class of Service and Company Type, 2005–2014. Print.

Only 7.5% of Interstate route-miles are currently paid for via toll financing (such as the New York Thruway, the Ohio Turnpike, etc.). However, as limited-access facilities, all the others could easily be converted to all-electronic tolling, which would permit toll financing of their reconstruction and modernization. A 2013 Reason Foundation policy study estimated that modest (but inflation-adjusted) per-mile toll rates would make it feasible to toll-finance such projects as long-term P3 concessions in all but a handful of low-population states.⁵

A small federal pilot program allows three states to each use toll financing to reconstruct a single Interstate corridor in their state, but thus far none of the three states that hold the slots in the program has achieved political consensus to move forward.

Parking Structures

Parking structures and parking meter systems have undergone significant technological improvements over the past decade, with many municipalities entering into P3 agreements to take advantage of these improvements by avoiding the need to spend tax money. Changes include increased automation of operations and increased collection rates, thanks to the use of electronic payments. The most likely candidates for private investment under P3 lease concessions are the largest 20 on-street parking systems, the largest university parking systems (perhaps two dozen), and parking systems of the largest dozen or so urban transit systems.

Chicago and Indianapolis entered into long-term P3 lease concession agreements over the past decade, but many municipalities merely outsource a particular parking service, such as collections or operations, while maintaining full ownership rights to the parking assets (meters, garages, and ground lots) in exchange for a share of the parking revenues. Universities, which have used P3 agreements for the construction of new buildings and student housing, also provide significant parking privatization opportunities, with the Ohio State University providing a recent example of a long term (50-year) P3 lease concession, which provided the school with an up-front payment of \$483 million. Transit systems provide additional opportunities for parking privatization activity.

Seaports

The United States has 99 ports that ship at least 2.5 million tons per year, which is sometimes used as the measure of a major port. The two largest in tonnage are the Port of South Louisiana and the Port of Houston, while the two largest container ports are the Port of Long Beach and the Port of Los Angeles. Our largest ports are dwarfed by the world's largest; for example, Long Beach and Los Angeles rank 19th and 20th on a list of the world's container ports.

⁵ Robert W. Poole, Jr., "Interstate 2.0: Modernizing the Interstate Highway System via Toll Finance," Policy Study #423. Los Angeles: Reason Foundation, September 2013.

Nearly all U.S. ports are operated by local public-sector port districts or port authorities, though a few are operated by state agencies, such as the Virginia Port Authority or the Port Authority of New York & New Jersey.

Worldwide, many ports have been privatized, starting with British port privatization in the 1980s. Asia and Latin America have had some port privatizations, and more recently Australia has begun privatizing all of its ports; most recently the Port of Melbourne, sold for \$7.3 billion to a consortium of two Australian pension funds, one Canadian pension fund, and Global Infrastructure Partners, the world's largest infrastructure fund (based in New York).

No U.S. port has been privatized. In 2009, CenterPoint Properties—the country's largest operator of intermodal rail/truck facilities—offered to lease the Port of Virginia for 60 years for cash payments and port investments worth over \$7 billion over the term of the lease. Two investment firms offered to submit competing bids, but the Port opted not to proceed, due to concerns over loss of control and opposition by localities near the port.

Some U.S. ports have entered into long-term leases of certain terminal facilities. In 2010 the Maryland Port Authority entered into a 50-year lease of its Seagirt Marine Terminal with Ports America, owned by an investment fund managed by Highstar/Oaktree. The company agreed to make an upfront payment and expand the terminal for a total of \$1.5 billion. There are also many privately operated terminals on property leased from various U.S. port authorities.

Water Systems

Water utility systems represent a fragmented market, with over 56,000 municipal water systems serving over 300 million customers.⁶ Private water companies serve about 75 million customers—about one-quarter of the U.S. population. These figures include both water and wastewater assets, and the private-sector figures include municipally owned infrastructure that the private sector manages.⁷ Water facilities provide many opportunities for P3 arrangements, from long-term lease concession agreements for new facilities, replacement and modernization of existing facilities, and more-targeted arrangements dealing with specific services such as desalinization and sludge treatment.

Public Works Financing reviewed water and wastewater service contracts that came up for renewal in their 2016 Annual Water Outsourcing Report. The report found that 71 of the 79 contracts they reviewed (of 89 total, with one contractor declining to have his 10 contracts included) in the previous year either got renewed (61 contracts, or 77%) or transferred to another private entity (10 contracts, or 13%). As noted in Reason Foundation's *Annual Privatization Report* for 2016, data from *Public Works Financing* show contract

⁶ American Water Works Association, *AWWA State of the Water Industry Report*, Table 1: U.S. Community Water System Summary (USEPA 2015). Print.

⁷ National Association of Water Companies, "Private Water Solutions." Web. <www.goo.gl/gIQXmEZu>

renewal rates of around 90% over the past decade for water-related privatization and outsourcing agreements, responsible for \$2.2 billion in business activity in 2015.⁸

Many larger cities in recent years have turned to P3 arrangements to address both shortfalls in funding and in capacity. In 2011 the city of Indianapolis transferred its water and wastewater systems to the nonprofit Citizens Energy Group in a \$1.9 billion deal that allowed the city to offload its water system debt while also receiving a \$500 million payment (which it used for transportation and parks infrastructure). A \$3.4 billion deal was approved in October 2014 that will enable the city of San Antonio to increase its water supply by 20% (16 billion additional gallons per year) via a new water pipeline system that will be designed, built, financed and maintained by a consortium of Abengoa Water USA and Bluewater Systems.

Wastewater Facilities

While wastewater treatment facilities and infrastructure are plentiful in the United States—approximately 15,000 treatment facilities and 20,000 wastewater pipe systems—aging assets raise concerns to those in the industry. According to the American Water Works Association’s (AWWA’s) 2015 and 2016 editions of its *State of the Water Industry Report*, the two biggest concerns for its members who responded were (1) renewal and replacement of aging water and wastewater infrastructure and (2) financing for capital improvements.⁹

Municipalities have entered into P3 agreements with private consortia to address these concerns, with the private entities often designing and building new infrastructure, in addition to providing operations and management of the facilities and infrastructure. Other P3s are focused on environmental concerns of wastewater management. Prince George’s County, MD signed a deal in November 2016 that partners the county with Corvias Solutions to make 2000 acres of land surface more porous, enabling greater absorption of storm water and reducing runoff into the Chesapeake Bay. If successful, future projects totaling another 15,000 acres could follow over the next decade.¹⁰

Waste-to-Energy Plants

Currently, there are 77 waste-to-energy (WTE) plants in the United States, of which 65 are privately operated, of which 41 are privately owned.¹¹ While the total number of WTE entities operating in the U.S. has fallen from 97 to 77 since 2001, the electric-generating capacity of WTE plants increased slightly during that time. Most of the gain happened in 2015, when the first new WTE facility since 1995 went online—

⁸ “PWF’s 20th Annual Water Outsourcing Report,” *Public Works Financing* No. 313, (March 2016). Print.

⁹ American Water Works Association, *AWWA State of the Water Industry Report*, 2015 and 2016.

¹⁰ Jim Watts, “MD County Pushes Ahead for Unique Storm Water P3,” *The Bond Buyer*, (Nov. 21, 2014).

¹¹ Energy Recovery Council, *2016 Directory of Waste-to-Energy Facilities*. <www.goo.gl/lmVEch>

Florida's Palm Beach Renewable Energy Facility Number 2, which also has the largest generating capacity of all U.S. WTE plants.¹²

2.2 Estimates of Unfunded Modernization Needs

In 2013, the American Society of Civil Engineers (ASCE) released its most recent *Report Card for America's Infrastructure*, which provides a broad assessment of the nation's infrastructure across 16 different categories.¹³ The *Report Card* also provides estimates of expenditures that need to be made to upgrade and replace aging infrastructure.

Among the sectors where the ASCE sees a need for additional investment over the next two decades include:

- Bridges: \$8 billion more per year
- Dams: \$2.3 billion more per year (Corps of Engineers dams only)
- Drinking Water: \$50 billion more per year
- Wastewater: \$15 billion more per year (for projects mostly needing completion in the next five years, according to a recent EPA survey of states and D.C.¹⁴)
- Roads: \$80 billion more per year.

Notably, these estimates are derived in a way likely to produce overstated amounts. For example, the drinking water figure, which originates from the AWWA, includes every inch of water delivery piping in the U.S. being replaced, which is unlikely to be needed or to be cost-effective. Many of the inputs driving these estimates originate from industry trade associations that generally do not include return-on-investment or cost-benefit analysis.

As another example, consider the number provided for needed annual highway investment. The most recent analysis by the Federal Highway Administration estimates needed investment to significantly improve conditions and performance.¹⁵ But FHWA's model includes a benefit/cost analysis. For the "improve" scenarios, two alternatives are using a benefit/cost (B/C) ratio of at least 1.0 or using a more stringent test of 1.5. Most serious analysts regard a project with benefits barely equal to costs as unlikely to be worth pursuing, especially if resources are limited (as they always are) and if projects are likely to exceed their initial budgets (as they often do). The total annual capital investment needed using the minimal B/C of 1.0,

¹² Ibid.

¹³ American Society of Civil Engineers. *2013 Report Card for America's Infrastructure*. <www.infrastructurereportcard.org>

¹⁴ U.S. Environmental Protection Agency, News Release, "EPA Survey Shows \$271 Billion Needed for Nation's Wastewater Infrastructure" (Jan. 13, 2016).

¹⁵ Federal Highway Administration, *2013 Status of the Nation's Highways, Bridges, and Transit: Conditions & Performance* (March 2014), Executive Summary.

combined with an FHWA's higher estimate of annual growth in vehicle-miles of travel, leads to an annual investment need of \$146 billion; compared with the recent annual average of \$88 billion per year, that leaves a gap of \$58 billion per year. But using the more realistic B/C filter of only projects with B/C of 1.5 or more reduces FHWA's annual investment need to \$112 billion. Compared to the recent average of \$88 billion per year, the needed additional investment per year would be just \$24 billion. That's a far cry from ASCE's figure of \$80 billion more per year.

Part 3

How Current Laws and Policies Limit Private Infrastructure Investment

3.1 Limitations of Government Enterprises

There is a widespread belief that government infrastructure is inherently less costly than investor-owned infrastructure, for three reasons:

- Lower financing costs thanks to tax-exempt bonds;
- Lower operating costs due to exemption from taxes on property and net income;
- Lower total cost because of no requirement to earn a profit.

But this perception is likely not correct. For example, empirical comparisons of investor-owned and municipal electric utilities show mixed results. One 1996 study found that investor-owned water companies provide comparable water service to customers, at comparable prices, but are significantly more efficient.¹⁶ If government-owned facilities were *inherently* lower-cost for the above reasons, would it not make sense for *all production* to be carried out by government firms? Yet the global record of government airlines, telecoms companies and other businesses is dismal. The institutional incentives within government enterprises generally do not lead to superior performance or lower costs.

A number of factors can lead to investor-owned firms having *lower* costs: economies of scale (in which a company serves multiple jurisdictions instead of just one), more-efficient use of labor, and more-efficient use of capital. Municipal utilities often “pre-finance” modernization in large blocks, whereas investor-owned utilities tend toward “just-in-time” finance of such projects. Municipal utilities often have to purchase bond insurance and accumulate reserve funds that are not required of larger and more-diversified investor-owned utilities. Moreover, although the interest rate paid on companies’ taxable revenue bonds is higher than that of municipal utilities’ tax-exempt bonds, the *amount financed* by a company may be less, thanks to a more cost-effective design of the new facility.

¹⁶ Kathy Neal, et al., “Restructuring America’s Water Industry,” Policy Study No. 200, Reason Foundation, January 1996, (<http://reason.org/news/show/restructuring-americas-water-i>)

Value-for-money analysis of privately financed infrastructure projects under long-term public-private partnerships takes into account the tax payments that will be made to local, state and federal governments, which may include local property taxes, as well as state and federal corporate income taxes. These tax revenues that benefit the respective governments are often overlooked.

Furthermore, government infrastructure enterprises generally do not charge market prices for their services. A Congressional Budget Office study found that “while both public and private [water] utilities usually set prices that are more than enough to cover operating costs, only private utilities routinely charge enough to fully cover not only operating costs but also the depreciation of capital facilities.”¹⁷ Below-market pricing misleads consumers about the true cost of the water, electricity or highway services they use. Cities that implemented “pay as you throw” pricing for garbage collection have higher rates of recycling and yard waste composting than those where garbage service is paid for via the property tax bill or charged for via a flat monthly fee.¹⁸ Government-run U.S. airports charge landing fees based solely on the gross weight of the plane, yet a small plane may use as much (or more) runway service as a large, faster plane. Privatized London Heathrow and Gatwick charge demand-based runway prices instead, to maximize the use of their scarce and costly runway capacity.

A variant of government ownership is the public authority, intended to operate with the efficiency of a private-sector firm while serving the public interest as part of government. Legal scholar Clayton Gillette compared the performance of public authorities with that of investor-owned firms operating under some kind of regulatory scrutiny. He found that the differences, summarized in Table 1, are large enough to prompt reconsideration of the public authority model.¹⁹

Table 1: Comparison of Public Authority and Investor-Owned Firm Performance		
Factor	Public Authority	Investor-Owned Firm
Accessible to voters	No	No
Subject to public interest regulations	Sometimes	Yes
Clear performance measures	Sometimes	Yes
Customer monitoring	Low	Low
Rating agency monitoring	Medium-high	High
SEC disclosure requirements	No	Yes
Managers' financial incentives	Low	High
Owners' financial incentives	No	Yes
Implicit state guarantee	Yes	No
Bondholders' monitoring	Yes	Yes
Shareholders' monitoring	No	Yes
Incentive to over-expand	Medium	Low
Procurement regulations	Sometimes	N/A
Managerial performance controls	Low-Medium	High
Corruption incentives	Sometimes	Low

Source: Clayton P. Gillette, “Public Authorities and Private Firms as Providers of Public Goods,” Policy Study #180, Los Angeles: Reason Foundation, September 1994.

¹⁷ Congressional Budget Office, “Financing the Municipal Water Supply,” Washington, D.C. (May 1987).

¹⁸ Lisa A. Skumatz, “Variable Rates for Municipal Solid Waste,” Policy Study #160, Los Angeles: Reason Foundation, June 1993.

¹⁹ Clayton P. Gillette, “Public Authorities and Private Firms as Providers of Public Goods,” Policy Study #180, Los Angeles: Reason Foundation, September 1994.

3.2 The Benefits of Privately Financed Infrastructure Modernization

In their paper proposing a \$1 trillion program to rebuild America’s aging infrastructure, Wilbur Ross and Peter Navarro identified an important global phenomenon that has largely passed the United States by: privately financed infrastructure modernization. According to a database maintained by the newsletter *Public Works Financing* since 1985, private infrastructure investment (in roads, rail, water and public buildings) worldwide totaled \$774 billion between 1985 and 2011. Of that total, a mere \$68 billion took place in the United States.²⁰

The basic model is a long-term concession, under which the winning private consortium will design, finance, build (or rebuild and modernize), operate and maintain an infrastructure facility. The project is overseen by a state or local agency under the terms of a detailed long-term concession agreement. The project is financed based on a dedicated revenue stream, generally from user fees paid to the consortium by those who use the facility’s services. Typical financing would be an equity investment of 20% to 30% of the project cost, with the rest financed in the capital markets, sometimes via bank loans but more often via revenue bonds. This is the basic model assumed in the Ross/Navarro paper.²¹

This model offers many advantages compared with typical government provision. In grant-funded projects (e.g., highways), projects are often selected more on political grounds than on economic grounds. They are paid for out of annual appropriations, rather than being financed on a long-term basis. And they are generally awarded to the contractor who submits the lowest-priced bid to build a fixed design. In many cases that leads to a less-durable design that costs far more to maintain than a more-durable design that would cost slightly more to construct. This is penny-wise and pound-foolish.

By contrast, projects procured as long-term, user-fee-financed concessions, have the following advantages:

- **Near-Term Development:** Thanks to financing that raises all the construction money up front, needed projects get built years or decades sooner.
- **On-Time Delivery:** Increasing evidence shows that these types of projects are far more likely to be completed on time, so users receive their benefits sooner.
- **Increased Investment:** New or increased user fees make it possible to invest more in infrastructure improvements than would be likely via status-quo tax funding.
- **Innovation:** Companies that will operate and maintain the infrastructure that they design and build are motivated to think outside the box, including design features that reduce cost and/or increase use of the facility (and hence revenues).

²⁰ William G. Reinhardt, “2011 Statistical Survey of Public-private Partnerships Worldwide,” *Public Works Financing* (October 2011).

²¹ Wilbur Ross and Peter Navarro, “Trump Versus Clinton on Infrastructure (and why it matters),” *FoxNews Opinion* (October 27, 2016).

- **Lower Life-Cycle Costs:** Rather than focusing on lowest-cost to construct, a concession company’s long-term interest is lower *total* costs (including operations and maintenance) over the facility’s useful life.
- **Risk Transfer:** Megaprojects procured conventionally are notorious for cost overruns and revenue shortfalls.²² Those risks are transferred to the company in long-term concession agreements, shielding taxpayers and customers from those risks.
- **New Tax Revenues:** As noted previously, to the extent that concession companies earn a return on their investments, they will pay federal and state corporate income taxes; depending on local tax laws, their projects might also be on the property tax rolls.

These points are discussed at greater length, with respect to highways, in a recent book by Cornell University economist Richard Geddes.²³

3.3 Overview of Barriers and Constraints on Private Investment

Although there has been an increase in P3 infrastructure projects in the United States in recent years, our use of this method still lags far behind that of our industrial competitors. In the transportation sector alone, a recap of major PPP concessions financed over the years 2008–2013 tallied concessions and their values by location.²⁴

Location	Number of Projects	Dollar Value (\$B)
United States	15	\$ 20.0
Canada	15	\$ 14.5
Europe	72	\$ 87.2
Latin America	56	\$ 38.4
Total	158	\$160.1

In other words, despite having the world’s largest gross domestic product, the United States attracted only 12.5% of the total private-sector investment in transportation infrastructure in North America, South America and Europe combined.

Pension funds, insurance companies and infrastructure investment funds express a strong desire to finance more large infrastructure projects in the United States. They do not lack incentives to do this; what they lament is the lack of a “pipeline of P3 projects” offered by state and local government agencies. Part of this is due to institutional inertia; making use of long-term infrastructure concessions is a new and different way of doing business, which relatively few state and municipal governments have made the effort to learn, so far.

²² Bent Flyvbjerg, et al., *Megaprojects and Risk*, Cambridge University Press, 2003.

²³ R. Richard Geddes, *The Road to Renewal*, The AEI Press, 2011.

²⁴ William Reinhardt, “Global Transportation Deal Flow (2008–2013),” *Public Works Financing*, October 2013.

But another major factor is a wide array of long-established government policies that favor traditional procurement and traditional government ownership, operation and maintenance of infrastructure facilities. Among the most important are tax policies. Both federal and state law exempt from taxation the interest on bonds issued by state and local governments. By contrast, in many cases P3 consortia must finance their projects using taxable bonds, which artificially increases their financing costs compared with traditional government projects. The United States is virtually alone in exempting infrastructure bonds from taxation. In addition, a municipal utility that performs the very same functions as an investor-owned utility is exempt from both local property taxes and federal corporate income taxes, but the investor-owned utility must pay both.

Also, a number of sector-specific federal policies treat an infrastructure facility differently if it was developed and operated as a P3 project.

- Many infrastructure facilities are partially funded by federal grants. Until 1992, an OMB rule required that if such a facility were privatized, all federal grant monies must be repaid—in effect, a federal tax on infrastructure privatization. The George H.W. Bush administration issued E.O. 12803 in 1992 to reduce such obstacles, but instead of eliminating grant repayment, it only reduced the amount to be repaid (equal to the portion of the facility value paid for by the grants that is currently un-depreciated). This still amounts to a federal tax penalty on the P3 transaction.
- A 1996 law creating an Airport Privatization Pilot program eliminated the grant repayment requirement for airports, but imposed a number of other constraints that have severely limited the usefulness of this program.
- In the wastewater facility area, the federal Resource Conservation & Recovery Act applies different regulations to P3 wastewater facilities than it does to “publicly owned treatment works.”
- Investor-owned water and electric utilities are treated differently from government-owned utilities by the Tax Reform Act of 1986. When investor-owned utilities receive “contributions in aid of construction” from would-be customers, the Act requires such payments to be counted as taxable income to the utility. But no such taxation applies to municipal utilities that receive comparable contributions.

These and other tax and regulatory disparities may not have been intended to discourage private investment in renewing infrastructure facilities, but they end up having exactly that effect.

Part 4

Sector-Specific Reforms

4.1 Airports

The two principal areas needing reform are the 1996 Airport Privatization Pilot Program and federal regulations on airports' self-help Passenger Facility Charges (PFCs).

Airport Privatization Pilot Program

After two decades, this pilot program has led to only one medium hub airport privatization (San Juan) and two pending applications, the small hub Westchester County (NY) Airport and the general aviation Hendry County (FL) "Airglades" Airport. To airport investors, the pilot program's many restrictions deter investment in U.S. airport projects.

Several of the regulations are not a problem, for example, keeping the airport in operation as an airport for public use, not abrogating current labor agreements, and not increasing airline charges by more than the annual inflation rate without airline approval. But other provisions need rethinking and reform by Congress. They are:

- **Remove limit of 10 airports:** Since airport privatization is now a well-established global phenomenon, the idea that the United States needs to "experiment" with privatization is obsolete. All airports should be allowed to take part, at their owner's option.
- **Partial privatization:** Another reform could emulate the European practice whereby the government owner could retain part-ownership while selling either a minority or majority interest to private investors.
- **Less-onerous airline approval requirement:** Current law requires a double super-majority of airlines in order for a P3 concession agreement to be approved (65% of all the airlines serving the airport *and* airlines representing 65% of the annual landed weight). This can be a significant barrier, and is unknown in other countries. A single, simple majority would prevent the risk of a small-airline veto.
- **Equal treatment for airport grant purposes:** Current law limits federal airport grants to a smaller percentage of project costs for privatized airports; such airports should receive the same treatment as government-run airports, since their passengers still pay the same ticket taxes that provide the funding for the Airports & Airways Trust Fund that is the source of the grant monies.

Passenger Facility Charge (PFC) Reform

Congress first allowed airports to charge passengers a fee to fund or finance airport improvements in 1990, as an exception to a 1973 “anti-head tax” law that had been enacted thanks to airline lobbying. The 1990 law permitted a PFC of no more than \$3 per flight segment. In 2000, Congress increased the federal “cap” to \$4.50, where it has remained ever since. Proceeds may be used only for projects approved by the FAA. For passengers making connections via a hub, the maximum PFC amount that can be charged is for four flight segments per round-trip (\$18). If an airport is to be privatized, it needs robust revenue sources to provide for debt service on revenue bonds for airport modernization projects. A federal cap on PFCs is arbitrary, and needlessly constrains the financing of such projects. Moreover, the fixed rate (unchanged since 2000) has allowed the real value of the \$4.50 PFC to be cut nearly in half by inflation.

PFC reforms by Congress should include the following:

- **Remove the federal cap on PFCs:** This would bring the United States into conformity with Canadian and European practice on per-passenger charges.
- **Downsize the Airport Improvement Program:** With the ability to charge higher PFC rates, large and medium hub airports could do without annual AIP grants for modernization projects. That would enable AIP to be downsized to serve only small and non-hub commercial airports and general aviation airports, with concomitant reductions in passenger ticket taxes.
- **Permit airports to have different PFCs for originating and connecting passengers:** This would reduce the concerns of small “spoke” airports about their passengers (most of whom need to connect at a hub airport) getting hit four times with much higher PFCs. This practice exists in Canada, where, for example, Toronto charges originating passengers C\$27 but only C\$4 for connecting passengers.

4.2 Interstate Highways

Two principal areas of reform are the current pilot program for toll-financed reconstruction and the federal ban on service plazas on non-tolled Interstates.

Interstate System Reconstruction and Rehabilitation Pilot Program

This very limited pilot program needs expansion by Congress in four ways.

- **Open it to all 50 states:** This would maximize the odds of a pathfinder state stepping forth with a political consensus on making use of the program—which so far has not happened.
- **Allow each state to use toll financing for all its Interstates:** This change would avoid political opposition to only one Interstate being “singled out” for tolling. It would permit a state DOT to develop a 20-year plan to rebuild and modernize all its Interstates using toll-financed P3 concessions.

- **Require “value-added tolling”:** Participating states must use the new toll revenues only for the capital and operating costs of their rebuilt and modernized Interstates, and may begin tolling an Interstate only after it is rebuilt (paying for value added).
- **Require fuel-tax rebates:** Participating states must grant rebates of federal and state fuel taxes for all miles driven on rebuilt, newly tolled Interstates. This is easy to do with all-electronic tolling. This change would obviate concerns about “double taxation” and would be a significant step toward replacing fuel taxes with mileage-based user fees.

Interstate Rest Areas as Service Plazas

Current federal law prohibits any commercial sales activity (other than vending machines) at rest areas on non-tolled Interstates. By contrast, tolled Interstates all have service plazas offering refueling, food and beverage choices, tourist information and shopping. A customer-friendly, second-generation Interstate system should do likewise. Two new services that would make sense to be included in some of the new service plazas would be (1) recharging stations for electric vehicles, in places where their drivers could spend the needed time having a meal and shopping, and (2) safe truck parking areas where truck drivers can get their federally required hours of sleep, with electricity hook-ups for their sleeper cabs. The only federal policy change needed is:

- Congress should repeal the ban on commercial activity at rest areas, for those Interstates that are rebuilt and modernized using toll financing.
- The new service plazas should be developed and operated either by the P3 developer/operator of the rebuilt and modernized Interstate or by a separate P3 agreement with a service plaza developer/operator.

4.3 Municipal Electric and Gas Utilities

Aside from creating a more level financial playing field for P3 lease concessions to modernize municipal utility systems, the other discriminatory tax policy that Congress should correct is the previously noted provision of the Tax Reform Act on 1986 that treats “contributions in aid of construction” as taxable income to IOUs but not to municipal utilities.

4.4 Water and Wastewater Systems

Unlike municipal entities that handle their systems “in-house,” water and wastewater facilities operated under long-term P3 agreements cannot issue tax-exempt bonds, which is often cited as a political argument against changing the status quo, despite the proven benefits of private capital and modernization. In addition to permitting tax-exempt revenue bonds for such P3 arrangements, removing state caps on tax-exempt

revenue bond issuance would also help, though this is generally a matter for state, not federal, policy. However, Section 146 of the federal tax code guides the volume cap, so Congress could amend that provision.

Municipalities can lose tax-exempt status for their existing bonds when a private entity acquires a long-term interest in their asset(s). While the IRS has provided a way to get around that issue, it has proven unhelpful for the water and wastewater sectors. Congress could modify Section 141 in the tax code to address this issue.

The EPA could make two changes without legislation. Once it receives funding from Congress, the EPA can ensure that P3-managed facilities are allowed equal opportunity to receive funding through the Water Infrastructure Finance and Innovation Act (WIFIA). Also, the agency could revise its narrow interpretation of the term “publicly owned treatment works” in the Resource Conservation & Recovery Act of 1976 to ensure that wastewater facilities that are operated privately under long-term P3 lease concessions receive the same regulatory treatment as government-operated facilities. A simple wording change to “public-purpose treatment works” instead of “publicly owned treatment works” would accomplish this. However, it would likely take congressional action to permit such equal treatment for any wastewater facility that was privatized via a *sale*.

4.5 Solid Waste Disposal

Municipalities and counties in many parts of the country have entered into waste disposal and recycling P3 agreements over the past few decades, to the point where the private sector now provides 78% of waste disposal activity in the U.S.²⁵ Since 1992, the municipal sector’s share has fallen from 35% to 22% after being 75% just over three decades ago. The same general problems of lack of equal access to tax-exempt revenue bonds and the constraint of state volume caps apply to this sector, as they do for water and wastewater.

4.6 Seaports

There is no significant federal regulatory barrier to port privatization or long-term P3 lease concessions. The Federal Maritime Administration requires various filings, but does not impose substantive regulations. Partial foreign ownership is sometimes seen as a concern, dating back to the 2006 controversy over the proposed acquisition by Dubai-based DP World of various U.S. port facilities from a British company, ultimately leading instead to the sale of the facilities to a U.S. company, Ports America. The DP World bid

²⁵ “Waste Market Overview and Outlook 2012,” *Waste Business Journal*, Overview. <www.goo.gl/BcOizU>

was terminated before it was submitted to CFIUS review. A subsequent terminal lease by the Port of Portland to a Philippine operator was submitted to CFIUS for review in 2011 and resulted in no opposition.

Potential port privatization is adversely affected, as with other U.S. infrastructure, by tax code discrimination. New-construction port projects can use tax-exempt financing only if they maintain “government ownership” under the code. But privatization of an existing facility, even via only a long-term lease (as in the CenterPoint Port of Virginia proposal), requires repayment of all existing tax-exempt debt, which adversely affects the financial return to the public entity and reduces the financial attractiveness of the transaction.

4.7 1992 Executive Order on Infrastructure

One reform that would address all state and local infrastructure facilities that receive federal grants would be to revise the partial reform regarding grant repayment that was brought about in the 1992 Executive Order 12803. Instead of eliminating the requirement to repay previous federal grants if a facility were to be leased or sold to enable private investment, E.O. 12803 merely reduced the extent of required repayment. A very simple revision of that document would remove the grant repayment completely, as was done only for airports in the 1996 federal Airport Privatization Pilot Program legislation.

Part 5

Leveling the Financial Playing Field

5.1 The Problem: Tax Discrimination Against Private Investment

For more than a century, state and local infrastructure provided by the public sector has been financed primarily by tax-exempt bonds—meaning that the interest paid to bond-holders is exempt from federal income taxes. Identical facilities built, owned and operated by investor-owned companies in most cases may only use taxable debt, carrying a higher interest rate and thereby incurring significantly higher financing costs.

This tax discrimination is unknown elsewhere in the world. Besides increasing the cost—other things equal—of privatized infrastructure, this also gives opponents of P3s an argument that P3s are a poor choice since their financing costs are higher. Even when that is not true (e.g., if the P3 project has a lower-cost design or lower life-cycle costs), the rhetorical argument can have political salience.

One major exception to this tax discrimination took place when Congress enacted the SAFETEA-LU surface transportation law in 2005. It authorized up to \$15 billion of tax-exempt Private Activity Bonds (PABs) for P3 highway and transit projects. PABs have subsequently been used for a growing number of large-scale highway and transit P3 projects, including the East End Crossing over the Ohio River near Louisville, the Eagle P3 transit line between downtown Denver and its international airport, and the Pennsylvania Rapid Bridge Replacement Project under which Pennsylvania is having the private sector refurbish or replace and maintain 558 deficient bridges.

The relatively new PABs program offers a preview of an expanded role for P3 infrastructure projects, if tax discrimination in project finance were to be eliminated. There are two ways in which this might be brought about. One would be to expand the availability of PABs to all the sectors of P3 infrastructure discussed in this report. A more radical approach would be for the United States to cease offering federal tax exemption on infrastructure bonds, regardless of public or private ownership.

The latter approach was analyzed in a 1995 policy study that estimated the impact of requiring all *new issues* of infrastructure bonds to be taxable, regardless of ownership of the facility.²⁶ For the five-year period of

²⁶ Robert W. Poole, Jr., *Revitalizing State and Local Infrastructure: Empowering Cities and States to Tap Private Capital and Rebuild America*, Policy Study #190, Los Angeles: Reason Foundation, May 1995.

1990–1994 it tallied all municipal tax-exempt infrastructure revenue bonds, which totaled \$50.85 billion over that five-year period, with an average maturity of 18 years. It then assumed that as each bond matured, it would be replaced by a taxable revenue bond. It then estimated net new federal tax revenue as the new bonds were phased in over 18 years; by the end of that period, new annual revenue was estimated to be \$24.5 billion.

Since that approach is not likely to be feasible, this paper does not re-do those calculations using current data on bond issuance and interest rates, but this remains an interesting longer-term possibility.

5.2 Creating a Level Infrastructure Finance Playing Field

Generalize PABs to All Public-Purpose Infrastructure

Realistically, the best way forward in the near term is to, in effect, expand PABs to cover P3 projects for all types of public-purpose infrastructure. Currently, only surface transportation projects have something resembling a level financial playing field. Other infrastructure—airports, ports, schools and other public buildings, parking structures, water and wastewater facilities—may use tax-exempt bonds under certain conditions but must comply with various IRS regulations and government controls. Airport terminal projects such as LaGuardia’s new Central Terminal can use tax-exempt debt (issued by the Port Authority) only by restricting the term of their concession agreement to less than the estimated useful life of the facility. Public buildings such as schools and courthouses must comply with IRS rules that limit management agreements with private parties to ones interpreted as not impairing the “public” character of the facility. Water and wastewater projects can use tax-exempt debt only if they can obtain an allocation of “volume cap” from the state in question.

Changing this may garner bipartisan support, since the Obama administration proposed a reform along these lines. In 2015 it proposed that Congress authorize a new kind of tax-exempt infrastructure bond called Qualified Public Infrastructure Bonds (QPIBs), intended to “extend the benefits of municipal bonds to public-private partnerships.” The White House Fact Sheet²⁷ added the following:

A similar existing program, Private Activity Bonds (PABs) has already been used to support financing of over \$10 billion of roads, tunnels, and bridges. QPIBs will expand the scope of PABs to include financing for airports, ports, mass transit, solid waste disposal, sewer and water, as well as for more surface transportation projects. Unlike PABs, the QPIB bond program will have no expiration date, no issuance caps, and interest on these bonds will not be subject to the Alternative Minimum Tax.

²⁷ Office of the Press Secretary, “FACT SHEET: Increasing Investment in U.S. Roads, Ports, and Drinking Water Through Innovative Financing,” The White House, (January 16, 2015).

So the first and most urgent policy change is for Congress to generalize the current PABs along the lines proposed for QPIB, specifically:

- Inclusion of P3s for all sectors of public-purpose infrastructure;
- No cap on the volume that can be issued;
- No expiration date;
- Not subject to the Alternative Minimum Tax (AMT).

Expand Generalized PABs to Existing Assets, for Asset Recycling

Current U.S. law, including PABs, encourages their use for projects that create new infrastructure facilities (referred to as “greenfield” projects) but not for the operation and ongoing maintenance of existing facilities (referred to as “brownfield” projects). In cases such as the long-term lease of the Indiana Toll Road or San Juan International Airport—both of which will involve significant reconstruction over their lengthy terms (75 and 40 years, respectively), not only did existing tax-exempt bonds have to be paid off but they had to be replaced by more expensive taxable bonds.

Other governments are taking a diametrically opposite view. The current governments of both Australia and Canada are implementing a policy called “asset recycling.” Under this policy, the national government is encouraging their states or provinces to privatize revenue-producing brownfield infrastructure facilities and use any net proceeds to the government (from the sale or lease) to invest in other needed infrastructure that does not have a stream of user-fee revenue (such as public buildings). Australia’s national government has committed to provide a bonus equal to 15% of the transaction proceeds to any state that thus “recycles” the net proceeds of an infrastructure sale or lease into other infrastructure projects. Canada’s national government is still developing its asset recycling program.

A positive U.S. step in this direction would be to authorize the use of expanded PABs to finance the long-term lease of brownfield infrastructure facilities, rather than restricting their use only to greenfield projects. For assets requiring major near-term reconstruction and expansion, there might not be any net proceeds to the government, but since long-term P3 concessions have a track record of better management and more cost-effective construction and modernization efforts, there are sound public policy reasons to shift their management to the private sector in advance of the need for major reconstruction.

Most importantly, this would facilitate long-term leases that can often generate large net proceeds for reinvestment in a whole range of other needed projects. The 2006 Indiana Toll Road lease generated \$3.3 billion of net proceeds that Gov. Daniels prudently reinvested in other transportation infrastructure—a very large statewide infrastructure program funded entirely without a tax increase. Australia expects to generate over \$100 billion from its asset recycling program, and the potential in the United States is much larger.

For state projects that yield net proceeds to the government, it is important to note that investing those proceeds is not encumbered by federal restrictions such as Davis-Bacon regulations or NEPA.

5.3 Impact on Federal Tax Revenues

Some will assert that the changes proposed here would cost the U.S. Treasury a significant amount of tax revenue if they were widely used. This would only be the case if most or all of the projects to build and rebuild U.S. infrastructure would otherwise have been carried out with taxable bond financing. The fact that we have a large-scale investment shortfall in infrastructure modernization suggests that very little infrastructure investment is taking place via taxable bond financing. Except for surface transportation P3 projects financed in part via PABs, U.S. infrastructure projects are overwhelmingly being financed via tax-exempt municipal bonds.

Only a handful of transactions have involved leases of brownfield infrastructure, such as the previously mentioned Indiana Toll Road and San Juan Airport. Those projects have required that previous tax-exempt bonds be replaced by taxable bonds. However, industry sources believe that a significant portion of such bonds has been purchased by pension funds that are themselves tax-exempt. The same thing occurred when taxable Build America Bonds were available for several years.

Any marginal loss of tax revenues that might result from allowing tax-exempt bonds to be used for both greenfield and brownfield infrastructure projects would be offset by increased federal tax revenues generated by the profits earned by P3 companies (to the extent that their projects are profitable, of course). To the extent that the volume of construction activity increased, there would also be gains in income taxes paid by construction workers, as more of them were employed and often worked overtime on a larger number of infrastructure projects.

Part 6

Additional Implications for U.S. Competitiveness

Besides the obvious benefits from increased and better-targeted investment to rebuild and modernize U.S. infrastructure, the United States will benefit in two other ways from the program outlined in this paper. First, by creating a much larger market for private capital in infrastructure, the program would attract significant inward investment from the growing number of global infrastructure investment funds. Secondly, as U.S. companies hone their expertise in developing, operating and maintaining first-class airports, toll roads, seaports, water and wastewater systems, etc., they will be in a position to compete with the current market leaders in these fields from Australia, France, Spain and other countries where P3 infrastructure has a longer and more-robust history.

6.1 Inward Investment by Global Infrastructure Investment Funds

The past 15 years have seen a proliferation of global funds seeking to invest equity in infrastructure projects that can generate a return on that investment. Since it is not possible to invest equity in government-owned airports, highways, utilities or seaports, these funds seek to invest in infrastructure that is already investor-owned, is being privatized via sale, or is or will be the responsibility of a long-term P3 concession.

Over the decade ending in 2015, infrastructure equity funds raised approximately \$350 billion, according to *Infrastructure Investor*, an industry periodical.²⁸ Since equity is about 25% of a typical revenue-risk P3 financing (with the other 75% being debt, such as revenue bonds), that \$350 billion could support projects worth \$1.4 trillion. During 2015 alone, the total raised was \$48.1 billion.

Most of these funds are global in nature, partly to diversify their investment portfolios. Some are focused on particular geographic regions, such as Europe, North America or Latin America. Most would very much like to invest more in the United States, with our rule of law, and relative absence of red tape and bureaucracy. But their frustration is that there is simply not the kind of “pipeline of P3 projects” that exists in Australia, Canada, Chile and other early-movers on P3 infrastructure.

²⁸ Robert W. Poole, Jr., “Transportation Finance,” *Annual Privatization Report 2016*, Ed., Len Gilroy. Los Angeles: Reason Foundation, July 2016.

By nationality, *Infrastructure Investor* found that the top 30 funds in 2015 broke down as follows, in terms of percentage of capital raised (shown in the Table below).²⁹

United States	39.8%
Australia	25.7%
Europe	15.4%
Canada	12.7%
Asia	4.4%
South America	2.0%

Thus, infrastructure investment funds are largely a phenomenon of highly developed countries.

Of the 30 largest infrastructure funds based on 2015 fund-raising, two are owned by public pension funds: IFM (Australia) and Borealis Infrastructure (Canada). U.S. pension funds are relative late-comers to investing in privatized and P3 infrastructure, but in the last several years major funds such as CalPERS, CalSTRS, the New York City Employees' Retirement Fund, the State Board of Administration of Florida, the Arizona State Retirement System, and the Illinois State Board of Investments have all made commitments to invest in this kind of infrastructure to diversify their portfolios. Their initial investments have been mostly overseas (e.g., Heathrow and Gatwick Airports), but more recently U.S. pension funds joined with those of Canada to acquire the P3 concession for the Chicago Skyway, and other U.S. pension funds joined with Australian pension funds to acquire the Indiana Toll Road concession.

The characteristics of long-lived, revenue-producing infrastructure with projected increased usage in coming decades is a good match for the investment needs of pension funds. However, greenfield projects are generally considered too risky for inherently conservative pension funds. They generally prefer brownfield projects, with long-established customer bases and a long revenue history. A hybrid type of project is the reconstruction of existing infrastructure, such as an aging water system or Interstate highway. It has the customer base and history, and if its future usage looks likely to be upward, that amounts to moderate risk compared with either pure brownfield or pure greenfield projects.

In short, there is no question that the equity capital is there, should federal policy encourage a large-scale expansion of P3 infrastructure in the United States.

6.2 Services Exports: Creating World-Class U.S. P3 Companies

One of the early concerns raised by some skeptics about P3 infrastructure was the leading role played by non-U.S. companies in transportation infrastructure projects, both greenfield and brownfield. A table

²⁹ "The Infrastructure Investor 30," *Infrastructure Investor*, November 2015.

compiled each year by *Public Works Financing* listing the world's top 35 P3 transportation companies includes exactly one (Fluor) domiciled in the United States, in position 34 as of 2015.³⁰

There is a simple reason for this: companies from countries such as Australia, France, and Spain in particular have 30 to 50 years of experience designing, financing, building, operating and maintaining airports, toll roads, seaports, water systems, etc. No U.S. companies have that expertise, since this country is a comparative late-comer to P3 infrastructure.

But that situation is starting to change. The few U.S. projects carried out in the 1990s and early 2000s were implemented almost entirely by firms or teams of firms from the above countries. But the trend in the last decade has seen winning teams that combine, say, a U.S. construction company, U.S. legal expertise, a global infrastructure fund, and numerous U.S. subcontractors. The best way for U.S. firms to become major players in this emerging field is for a much larger pipeline of P3 infrastructure projects to be offered by state and local governments. And once U.S. firms have mastered the art of being in the airports *business*, the water system *business*, or the toll roads *business*, they will be ready to test their mettle against the world-class P3 firms of Europe and Australia.

It may take a decade or more until several U.S. P3 companies appear in the middle ranks of the world's leading P3 firms, but the most likely way for that industry to develop is for U.S. policy to encourage this model of infrastructure provision to be used far more widely.

³⁰ William Reinhardt, "2015 Survey of Public-Private Partnerships," *Public Works Financing*, October 2015.

Related Reason Foundation Studies

Annual Privatization Report 2016: See sections on Air Transportation, Transportation Finance, and Surface Transportation. Ed. Leonard Gilroy. November 21, 2016.

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His 1988 policy paper proposing supplemental privately financed toll lanes as congestion relievers directly inspired California’s landmark private tollway law (AB 680), leading to similar public-private partnership legislation in about two dozen other states. In 1993 Poole that introduced the term HOT (high-occupancy/toll) Lane, a concept which has become widely accepted since then.

Poole has advised the Federal Highway Administration, the Federal Transit Administration, the White House Office of Policy Development and National Economic Council, the Government Accountability Office (GAO), and the California, Florida, Georgia, Indiana, Texas, Utah, Virginia, and Washington State Departments of Transportation. He has served on various transportation committees throughout the U.S.

Poole is the author of dozens of policy studies and journal articles on transportation issues. His popular writings have appeared in national newspapers, including the *New York Times* and *The Wall Street Journal*; he has also been a guest on such network TV programs as “Crossfire,” “Good Morning America,” and “The O’Reilly Factor,” as well as ABC and NBC News. He writes a monthly column on transportation policy issues for *Public Works Financing*, and produces the monthly e-newsletter, *Surface Transportation Innovations*. The *New York Times* has called him “the chief theorist for private solutions to gridlock.”

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