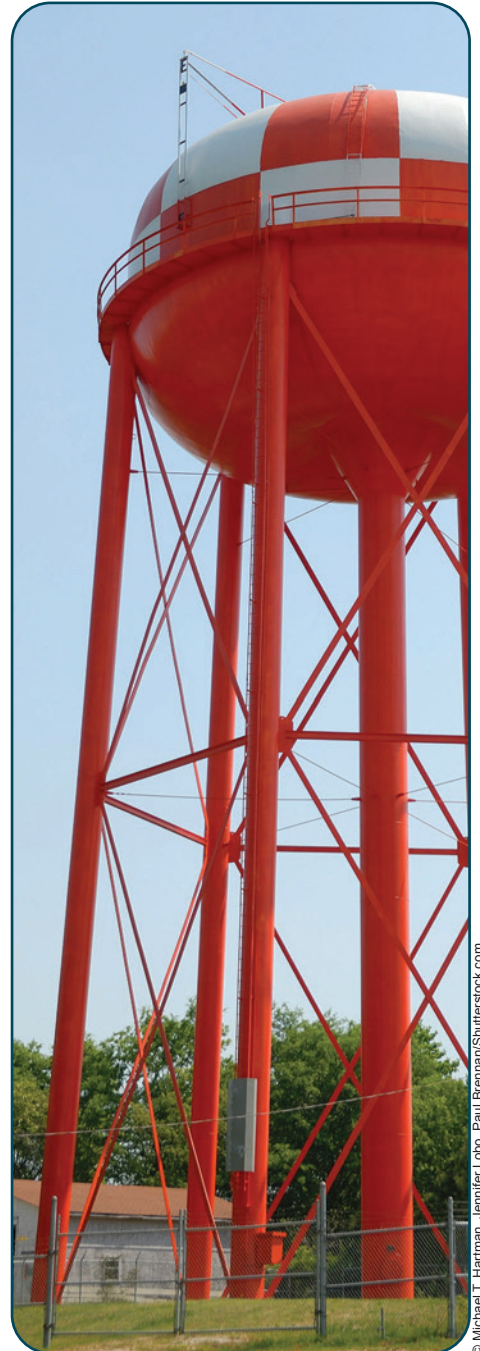


# CBO

## Public-Private Partnerships for Transportation and Water Infrastructure



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## At a Glance

In fiscal year 2017, federal, state, and local governments spent \$441 billion to design, build, operate, and maintain transportation and water infrastructure in the United States. Public-private partnerships are arrangements that are intended to motivate private parties to achieve those outcomes more efficiently by combining project stages (and sometimes private financing) in a way that transfers risk to the private party. Such partnerships are not used very often. The Congressional Budget Office estimates that public-private partnerships have accounted for 1 percent to 3 percent of spending for highway, transit, and water infrastructure since 1990.

Other arrangements that involve private parties do not transfer risk from the government to the private sector and are not a public-private partnership as defined in this report. For example, if the government guarantees the repayment of private financing, the private party is in essence just an intermediary for public financing.

This report assesses whether public-private partnerships have resulted in projects being built more quickly or at a lower cost for taxpayers than other arrangements. The report also examines whether partnerships that include private financing sped up project financing.

- **Speed, Cost, and Quality.** Highway partnerships have shortened design and building phases and lowered costs, albeit not in all cases and by small amounts on average. Water partnerships sometimes have lowered operation and maintenance costs and improved compliance with regulatory standards.
- **Financing.** Private financing probably accelerated infrastructure projects in states with budgetary limits or legal constraints on spending or borrowing, but such projects are ultimately paid for using taxes or user fees. In general, the overall cost of private financing is similar to that of public financing when interest rate subsidies, the cost of risk, and transaction costs are accounted for.
- **Other Outcomes.** Some partnerships have resulted in bankruptcies for the private partners, canceled projects, or unfavorable outcomes for the public partner as a result of poorly written contracts or a loss of public control over the project.
- **Trends in Financing.** In recent decades, state and local governments have transferred less risk through private financing for highway partnerships. One way for private financiers to limit their risk is to receive repayment directly from state and local governments, rather than from riskier sources such as tolls. Over the past decade, 44 percent of private financing was to be repaid directly by governments, compared with 17 percent in the two decades before that. Moreover, the share of private financing subsidized by federal taxpayers grew from 25 percent to 49 percent over those periods.



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## Notes

Unless this report indicates otherwise, all years referred to are calendar years.

Numbers in the text, tables, and figures may not add up to totals because of rounding.

Where noted, to remove the effects of inflation, the Congressional Budget Office adjusted dollar amounts with the gross domestic product price index from the Bureau of Economic Analysis.

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# Public-Private Partnerships for Transportation and Water Infrastructure

## Summary

Federal, state, and local governments spent \$441 billion on transportation and water infrastructure in fiscal year 2017, and there is widespread demand for greater investment. All levels of government face calls to improve highways and other transportation systems and to make drinking water and wastewater systems safer and less expensive for users. Some analysts have suggested that public-private partnerships might contribute to those improvements by providing private parties with incentives to complete projects more efficiently—in less time or at lower cost. Other observers have noted that public-private partnerships that include private financing could contribute to the financial resources used for transportation and water infrastructure. Such partnerships, however, impose costs on the federal government when they draw on federally supported financing.

This Congressional Budget Office report explains the differences between the use of public-private partnerships for transportation and those for water infrastructure. It determines whether partnerships without financing build projects more quickly or less expensively for taxpayers. Finally, it assesses whether partnerships that included private financing sped up the financing process.

## What Are Public-Private Partnerships, and How Are They Used for Transportation and Water Infrastructure?

Traditionally, state and local governments have hired private firms as contractors responsible for a single stage of a project, such as construction or maintenance. In a public-private partnership, however, the private partner is responsible for multiple stages of a project—among them may be designing, building, financing, operating, and maintaining the infrastructure—in a way that transfers risks to the private partner and creates incentives for that partner to be efficient. Those risks can include the possibility of cost overruns, delays in the construction schedule, or shortfalls in a project's revenues.

In a partnership that uses private financing, the private partner is generally compensated in one of two ways:

- In some cases, partnerships that use private financing have been repaid with payments from the state or local government as the private partner builds or maintains a highway in a way that meets performance criteria specified in the partnership contract.
- In other instances, such private financing has been repaid with revenues generated by fees, such as highway tolls, from infrastructure users.

In either case, the private partner's profit depends on the project's success, which increases the private partner's incentive to achieve the best outcome at the lowest cost.

Under other kinds of arrangements, payments to the private partner are effectively guaranteed regardless of a project's outcome; because no risk is transferred, CBO does not consider such arrangements to be public-private partnerships. Such instances are essentially third-party financing: The private entity lends money to a government in lieu of the government's borrowing by issuing bonds.

Public-private partnerships that provide transportation and water infrastructure are uncommon in the United States. They have represented just 1 percent to 3 percent (depending on the type of infrastructure) of such projects since the early 1990s. Highway partnerships, particularly those that involve private financing, have become more common since the late 2000s. Private financing has also been used a few times recently for other kinds of transportation projects, such as airports and transit and commuter rail facilities. Public-private partnerships for municipal water utilities (facilities that provide drinking water and handle wastewater) began to be used more frequently in the late 1990s, when the Internal Revenue Service (IRS) loosened restrictions on private contracts



for operation and maintenance activities. Their use has since leveled off.

### **How Can a Public-Private Partnership Affect an Infrastructure Project?**

A public-private partnership can increase a private entity's incentive to achieve the best outcomes at the lowest costs relative to a traditional arrangement, but a public-private partnership also risks negative consequences for taxpayers. By consolidating responsibility for two or more stages of a project in a public-private partnership, the private partner has greater incentive to incur up-front costs that ensure the facility's longer-term performance. Effective consolidation of such responsibility requires a carefully written contract that allocates some risk to the private partner. Consider a private partner that is paid a fixed fee for both building and maintaining a facility. To minimize the risk of high maintenance costs, the private partner may choose to use more expensive but longer-lasting construction materials than if it were paid a fee for only building the facility, as might happen under a traditional contracting arrangement. Through such channels, public-private partnerships can lower costs to taxpayers. However, in some cases, poorly written contracts have led to unfavorable outcomes for users and taxpayers. Such outcomes include private entities' interpreting contract terms in a way that allowed those entities to charge higher tolls or water use fees than were initially anticipated. In other circumstances, state and local governments were restricted from making necessary improvements to competing facilities.

The total cost of a public-private partnership does not depend on whether its financing is provided by the public sector or the private sector. If financing is provided by the public sector, the taxpayers directly bear the cost of servicing any debt and indirectly bear the cost associated with the risk that the value of the infrastructure will be unexpectedly low (or high) relative to the cost of the financing. If the private sector provides financing, those costs are shifted but do not disappear. The private entity expects a return to compensate for bearing those risks. Because that compensation comes through government payments and user fees, taxpayers or users of the infrastructure ultimately bear the costs. However, different financing arrangements can shift costs among different taxpayers and the private partner. For example, for a state or local government, the cost of tax-exempt borrowing is lower than the cost of private financing because federal taxpayers subsidize borrowing through tax-exempt

bonds. In addition, different financing arrangements are subject to different external constraints. For example, many state governments have budgetary limits or legal constraints that limit their ability to issue debt.

### **What Has Experience Shown About Partnerships?**

The past three decades of experience with infrastructure partnerships indicates that they tend to be used differently for different types of infrastructure. In highway partnerships, a private partner more often is paid by the government and is responsible for work that combines design and construction, after which the government then operates and maintains the highways. In water utility partnerships, the private partner more often is paid by user fees and is responsible for the combination of operation and maintenance.

Studies show that highway partnerships have slightly reduced the average length of design and building phases and slightly lowered costs on average for taxpayers. However, the data are limited, and it is difficult to evaluate what the experiences would have been without the partnerships. In addition, private financing has probably helped accelerate projects in some states by providing financing more quickly than under more traditional arrangements such as public debt offerings. But highway partnerships have also resulted in bankruptcies, canceled projects, and delays. For example, unexpectedly weak highway toll revenues in the wake of the 2007–2009 recession led to a spate of bankruptcies among private partners that provided private financing.

Perhaps as a result of those experiences, in the past decade highway partnerships have generally transferred less risk to private parties than in previous decades. In particular, from 1993 to 2008, 83 percent of the financing for privately financed highway projects was to be repaid with toll revenues collected by the private partner. Since the 2007–2009 recession, that figure has declined to 56 percent. During those same periods, the share of private financing that was to be repaid by a state or local government increased from 17 percent to 44 percent. Similarly, among projects that included private financing, there was an increase in the share of total financing that was federally subsidized. From 1993 to 2008, 25 percent of the financing of such projects came from tax-preferred bonds or direct lending by the federal government. After 2008, 49 percent of the financing was federally subsidized.

Table 1.

### Activities Involved in Each Stage of Transportation and Water Infrastructure Projects

Stage	Activities
Design	Complete plans for the project, which includes producing architectural drawings and selecting construction materials.
Build	Construct the facility, which includes reviewing the condition of the site; providing construction crew, materials, and equipment; and amending the design as needed to address problems discovered during the construction phase.
Finance	Provide capital for the project, which may include issuing debt or equity and verifying the feasibility of plans for repaying debt or providing a return on equity.
Operate	Ensure the performance and availability of the facility, which includes, for example, removing snow from roadways and debris from storm drains, and collecting fees from users.
Maintain	Keep the project in a state of good repair, which includes filling potholes, repairing pipes, or fixing tracks.

Source: Congressional Budget Office.

Unlike highway partnerships, partnerships for water utilities have focused more often on long-term operation and maintenance instead of construction. Private partners have often helped bring a utility into compliance with the Environmental Protection Agency's (EPA's) regulations. Some studies show that such partnerships have achieved cost savings for taxpayers relative to traditional arrangements. Nonetheless, partnerships for water utilities remain rare. Several factors have probably helped limit such partnerships. Those factors include concerns about fee increases by private partners, difficulties in foreseeing contingencies, and the availability of options for reducing costs and improving outcomes without giving up public control.

### Approaches to Providing Transportation and Water Infrastructure

Governments—federal, state, or local—provide almost all transportation and water infrastructure in the United States. In federal fiscal year 2017, state and local governments accounted for most spending on that infrastructure—\$342 billion—and the federal government spent \$98 billion. About two-thirds of the federal spending, \$69 billion, represented grants made by the federal government to state and local governments, and \$30 billion was for federally owned infrastructure.

Traditionally, private companies have been contractors responsible for single stages of a transportation or water project, such as construction or maintenance. By contrast, in a public-private partnership, the private partner takes responsibility for multiple stages of a

project, in return for the opportunity to realize efficiencies from combining those stages and to make a profit from the revenues it receives. Sometimes, the private party provides financing for the project as well. To date, public-private partnerships have undertaken a very small share of the transportation and water infrastructure projects carried out at all levels of government, although their use for highways has increased over the past decade, and interest in them continues to grow.

### The Traditional Approach

Transportation and water infrastructure projects involve five major stages of activity—typically referred to as design, build, finance, operate, and maintain (see Table 1). The traditional approach of state and local governments to such projects, known as the design-bid-build approach, is used nearly uniformly across the United States. The state or local government pays for a project with some combination of its own funds, funds provided by the federal government, and borrowed funds that are repaid using revenues from future taxes or user fees. (Because state and local governments can issue bonds whose interest is exempt from federal income tax, they can borrow money at interest rates that are lower than those for bonds without the tax exemption.) Once funds are secured, a public manager—generally a state department of transportation, a local water authority, or other public entity—either designs the project itself or hires a private firm to design it. A different private entity, which is usually selected on the basis of the lowest bid, builds the project. After the project is completed, the public agency then manages operation and maintenance,

although in some cases it hires a private firm to perform some of the work.

Under that traditional approach, private firms that have signed contracts to build a facility or perform other project-related tasks take on a limited amount of risk, but most of the risk remains with the government that wrote the contract. For example, private contractors can pass on to the public agency any increase in their costs as a result of changes in the scope or details of the project, a feature of the traditional approach that increases the chances that the cost to the government will exceed the private firm's bid. Although the public agency retains a high degree of control over the facility, it also retains the risk of cost overruns, delays in the construction schedule, problems with the design or construction of the infrastructure, and any shortfalls in the revenues generated by its use.

### Public-Private Partnerships

A public-private partnership transfers risk to the private partner by giving it control of more than one of the five stages of activity. Some observers apply the partnership term only to projects that also include private financing. For this report, CBO has evaluated contractual arrangements that combine multiple stages and transfer more risk from the public sector to the private sector than is the case under the traditional approach, irrespective of whether private financing is involved. Although a public-private partnership assigns control of the infrastructure to the private partner for a limited time—in effect giving it temporary ownership of a facility—a partnership is different from full infrastructure privatization, in which a public facility is sold to a private entity. (For more detail on the relative roles of government and the private sector in providing infrastructure, see Box 1.)

**Transfer of Risk.** The transfer of risk sets a partnership apart from traditional private contracts with the government. Governments regularly hire private companies to produce a good (such as a piece of equipment) or provide a service (such as designing a building) without risk sharing in order to realize the efficiencies offered by private production. Even when the government hires the same company to perform multiple stages of a project, CBO does not consider the agreement a partnership if it does not also transfer risk to the private company. For example, in a third-party financing arrangement, the government may hire a private firm to finance, design, and build a facility such as military housing. Such an

arrangement does not transfer risk because the public sector guarantees the private firm a minimum level of use—and revenues—for a number of years.<sup>1</sup> Although the private firm in such a third-party financing arrangement assumes responsibility to finance, design, and build the new facility, the guaranteed revenues from the government limit the amount of risk the company incurs.

In a partnership, the contractor assumes risk through the terms of its contract. In theory, the most efficient allocation of risk gives the responsibility for managing each risk to the party with the most expertise in or greatest ability to manage the risk, using a contract structured in such a way that each party has an incentive to mitigate those risks. In practice, such efficient allocation can be difficult to achieve.

**Common Combinations of Stages.** The transfer of risk is accomplished largely by combining responsibility for multiple stages of a project so that the private partner bears the risk of cost increases or other financial shortfalls. The most common combinations include:

- Design and build;
- Operate and maintain;
- Design, build, and finance, or design, build, finance, operate, and maintain.

*Design and Build.* Infrastructure partnerships are often set up as contracts (known as design-build contracts) between a private entity and a public agency to jointly manage the design and construction of a new facility. Under such an arrangement, the private party accepts most or all of the risk of cost increases associated with the project. In some projects, the private partner also provides a warranty guaranteeing the integrity and quality of the finished product. The public partner retains ownership of the facility, collects any user fees, and manages its operation and maintenance.

*Operate and Maintain.* In partnerships that combine operation and maintenance, the government leases an existing facility to a private owner that then takes responsibility for operating and maintaining the infrastructure

1. For more information, see Congressional Budget Office, *Third-Party Financing of Federal Projects* (June 2005), [www.cbo.gov/publication/16554](http://www.cbo.gov/publication/16554).



**Box 1.****The Roles of the Government and Private Sector in Providing Infrastructure**

For some types of infrastructure, the role of the private parties typically is limited to that of a contractor. In other cases, private parties play a larger role or own infrastructure outright. Certain classes of infrastructure tend to be owned by state and local governments, the federal government, or private companies.

One reason the government owns certain types of infrastructure is that they amount to public goods, and charging consumers for using the infrastructure can be difficult or economically inefficient. For example, dams and other natural resource projects provide various benefits, such as flood control and recreation, to a wide range of consumers, making it hard to know whom, and how much, to charge for those services. And in some cases—building an additional home in an area protected by a dam, for instance—the services can be provided to an additional consumer at no extra cost. In such instances, governments often provide the infrastructure.

A second reason is that economic benefits of providing some kinds of infrastructure—promoting commerce, for example—extend beyond the place where it is built and the people who use it directly. However, because private firms cannot easily charge for such benefits, the private sector often ignores them in deciding whether to invest in particular projects. That consideration limits the incentives for private companies to provide such infrastructure, and relying on them to do so may result in less of that type of infrastructure than would be socially desirable. In such cases, governments also typically supply the infrastructure.

A third reason is that some types of infrastructure—such as a transit system or air traffic control—generate economies of scale such that only one firm could profitably provide the services. Governments often provide the infrastructure in such circumstances to avoid creating private monopolies (or, if they are allowed, regulate the prices charged by the private owner).

In practice, infrastructure ownership has been distributed as follows:

- **State and Local Ownership.** State and local governments own most of the highways, water utilities, and transit

systems. Schools and prisons are also usually owned by state and local governments, although some are federally or privately owned.

- **Federal Ownership.** The federal government provides other kinds of infrastructure. For example, it owns and operates much of the air traffic control system through the Federal Aviation Administration and builds dams and locks administered by the Army Corps of Engineers. Some infrastructure is provided by government corporations such as the Tennessee Valley Authority. (Government corporations typically provide a market-oriented public service and produce revenues to offset some of their expenditures.) In some cases, the federal government retains ownership of facilities that serve a government mission, such as low-activity air traffic control towers and research facilities like the Jet Propulsion Laboratory, but aims to realize management efficiencies by contracting with a private company for their operation.
- **Private Ownership.** The private sector owns and operates much of the telecommunications infrastructure and some of the energy infrastructure. Private companies provide telecommunications and broadband Internet connections (in some cases subject to regulation by the Federal Communications Commission) to communities throughout the country.<sup>1</sup> Private companies also provide pipelines for moving oil and natural gas. Many local electric utilities are privately owned as well (although some are owned by local government entities).<sup>2</sup> In addition, privately owned drinking water systems (which are different from public-private partnerships because they are owned privately outright) serve between 10 percent and 15 percent of the population.

1. However, Kentucky entered into a public-private partnership in 2015 for the design, building, financing, operation, and maintenance of a statewide network of major fiber-optic cable to provide broadband Internet connectivity.

2. For estimates of private-sector spending by type of infrastructure, see Congressional Budget Office, *Issues and Options in Infrastructure Investment* (May 2008), [www.cbo.gov/publication/19633](http://www.cbo.gov/publication/19633).

in exchange for the ability to charge for its use. Once the lease expires, control transfers back to the public entity. Governments may use the proceeds from a lease to carry out other infrastructure projects or for other purposes, although they no longer receive the stream of revenues that they would have had if they had retained control of

the facility. The private entity typically bears the risk of shortfalls in demand and cost overruns.

When the proceeds from a lease are then used to build other kinds of infrastructure, the approach is sometimes called asset recycling. So far, asset recycling has been used

more frequently in other countries, particularly Australia, where ownership of infrastructure by federal, state, and local governments and the private sector is somewhat differently allocated.<sup>2</sup>

Sometimes, a partnership is structured as a long-term management contract rather than a lease. In a management contract, the public sector retains control of the facility but pays a private firm a set fee to operate and maintain it over an extended period. The private firm bears the risk of cost overruns. It is less risky than a lease for the private firm because the government payments are guaranteed. The longer the duration of a lease or management contract, the more risk is transferred to the private sector. That occurs because the private sector is exposed to the possibility of unexpected costs for a longer period. That risk transfer gives the private partner more opportunity to earn a profit by making investments that reduce future costs. Management contracts are common for water utility partnerships and usually last from 10 to 20 years.

*Design, Build, and Finance, or Design, Build, Finance, Operate, and Maintain.* Many design-build projects also include private financing, which exposes the private partner to the risk associated with generating revenue to repay the loan. When a project is large enough that the state government, local government, or other public authority must borrow money to move the project forward, the public entity has two options: It can finance the project by issuing government bonds, or it can obtain financing from a private partner. Regardless of whether a public-private partnership involves financing, the public sector owns the facility at the end of the contract (or lease) period. Such an arrangement sometimes includes the operation and maintenance of the facility once it is complete.

In some instances, although arrangements are reported as including private financing, the terms of the agreement are such that the financial risk for repaying the debt incurred by the private partner has essentially been borne by taxpayers. Under one program in Florida, for example, private businesses financed several projects entirely with private debt that was to be repaid over a relatively short, predetermined time—usually five years—with

future grants from the federal government, state funds, and revenues from tolls paid by users of the completed road. The state's guarantee of repayments for those projects eliminated much of the transfer of risk that takes place with other privately financed projects. Thus, the financing was essentially public. Because the private partner did not take on risk, CBO excluded those Florida projects and similarly built projects from its analysis of public-private partnerships.

**Emergence of Partnerships and Recent Trends.** In the late 1980s and early 1990s, governments in Australia and the United Kingdom began to partner with private companies to finance road and railway projects.<sup>3</sup> Once established, they became the prototypes for subsequent initiatives for the construction of schools, public housing, and prisons, as well as for water and waste management projects. International experience with public-private partnerships now extends well beyond Australia and the United Kingdom. By 2010, the value of contracts for major partnerships worldwide exceeded \$700 billion (expressed in 2018 dollars); half that amount was for road projects.

Public-private partnerships for transportation and water utilities in the United States began in the 1990s. New highway partnerships with a design-build component increased both in value and in number in the late 2000s, particularly those financed by the private partner (see Figure 1 and Figure 2). By contrast, transit and rail partnerships have only recently included private financing.

The number of new water utility partnerships that include design, build, operation, and maintenance increased in the late 1990s as a result of changes to tax law allowing for longer-lasting partnerships. Unlike partnerships for transportation projects, most of those partnerships included provisions for operation and maintenance, which accounted for the bulk of their value. New agreements were more common in the late 1990s and 2000s than they have been recently, and few such projects have been undertaken in recent years. However, in 2016 San Antonio, Texas, approved one of the largest-ever contracts with the private sector for a water utility partnership encompassing designing, building, operating, and maintaining facilities. It remains to be

2. For an introductory discussion, see Jake Varn and Sarah Kline, "How Could 'Asset Recycling' Work in the United States?" (blog entry, June 8, 2017), <https://tinyurl.com/y4xhmuzu>.

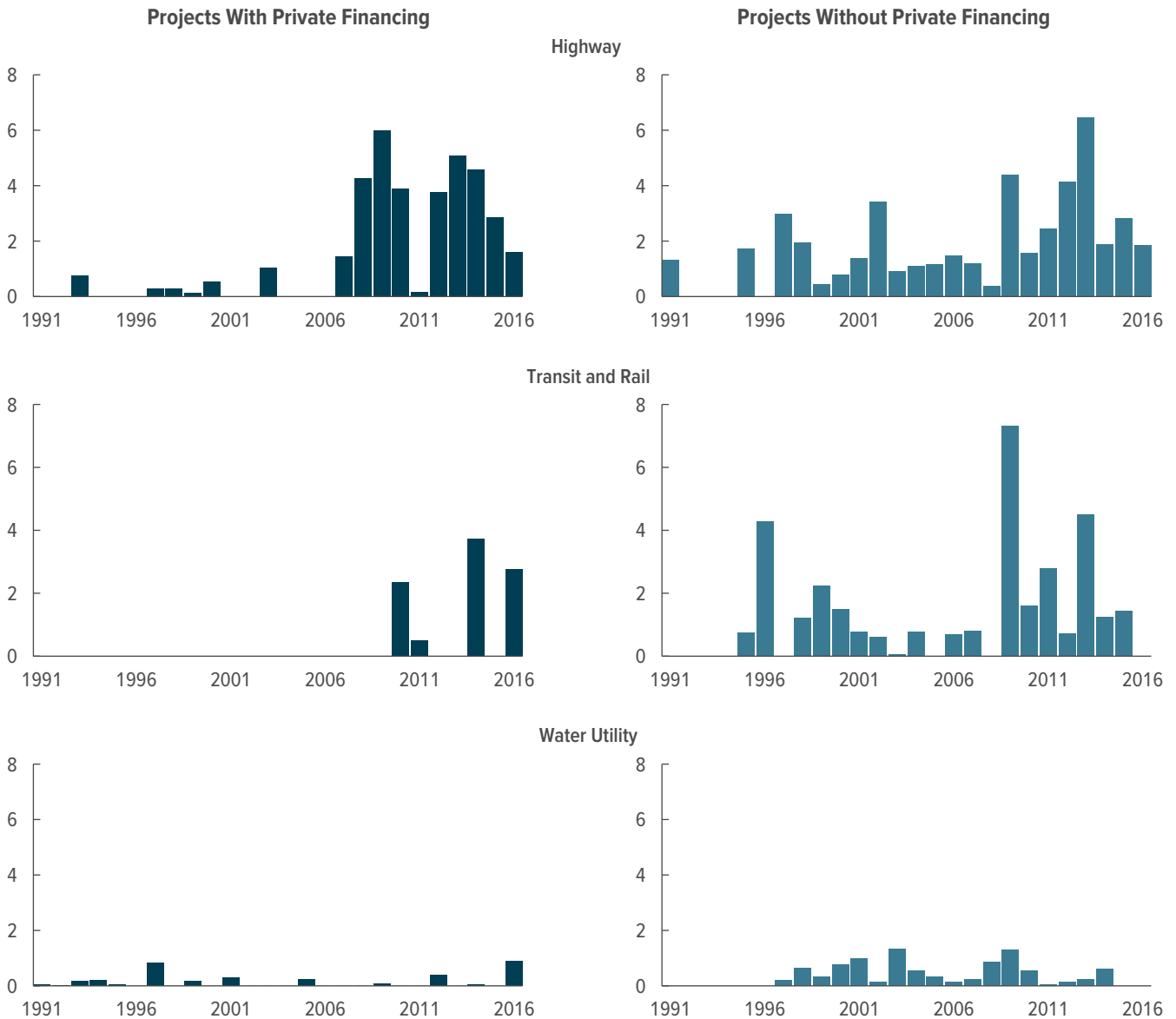
3. For further discussion, see Congressional Budget Office, *Using Public-Private Partnerships to Carry Out Highway Projects* (January 2012), Appendix A, [www.cbo.gov/publication/42685](http://www.cbo.gov/publication/42685).

Figure 1.

**Value of New Partnership Contracts for Projects Designed and Built by a Private Partner, by Type of Infrastructure and Financing**

The value of new highway, transit, and rail partnership contracts that include a design-build component increased in the late 2000s, particularly those involving private financing. The value of water utility partnership contracts that include a design-build component was higher in the late 1990s and 2000s than it has been recently.

Billions of 2018 Dollars



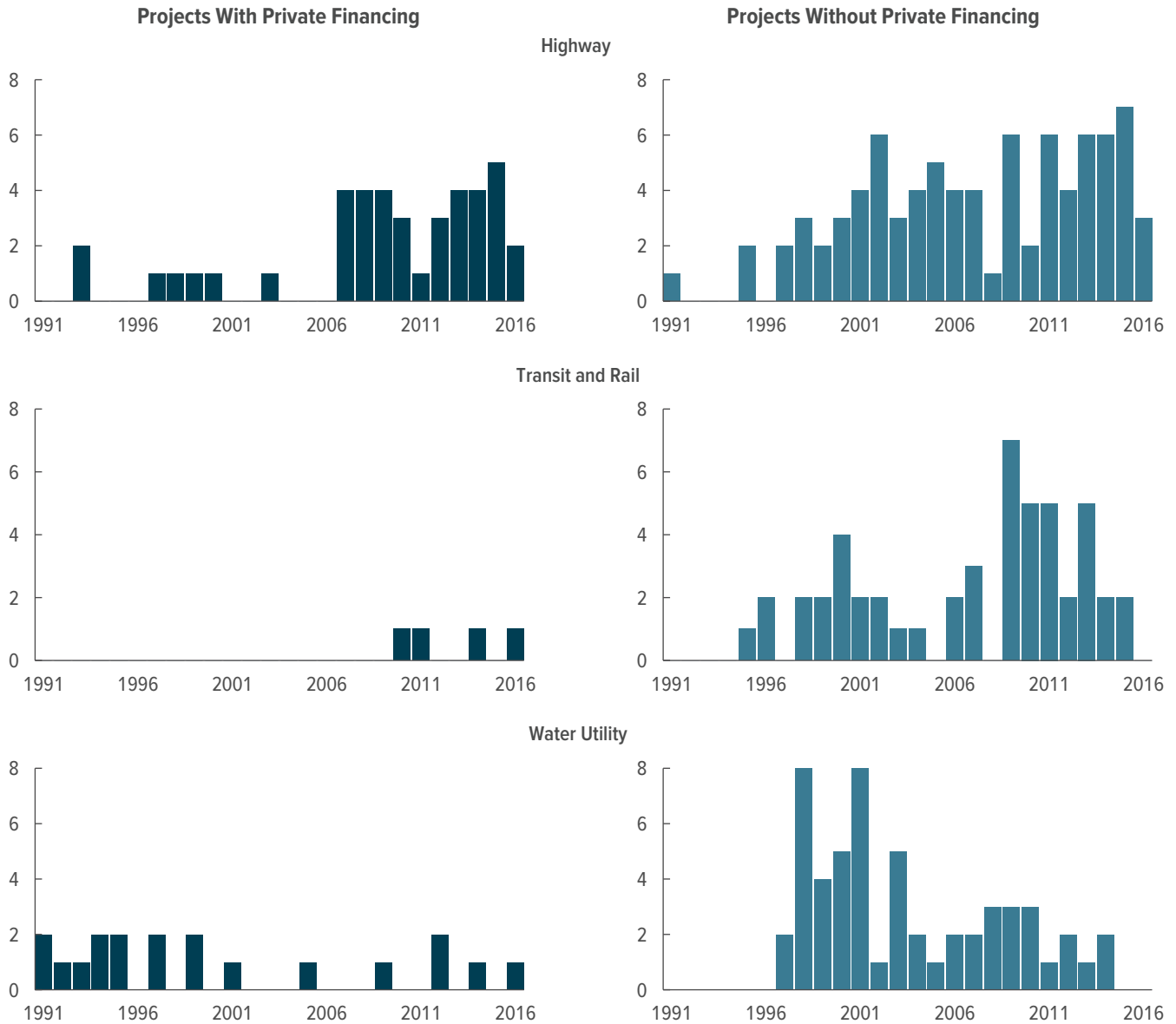
Source: Congressional Budget Office, using data from the Federal Highway Administration and *Public Works Financing*.

For highway, transit, and rail projects, only projects with a value greater than \$50 million are included in this figure.

Figure 2.

**Number of New Partnership Contracts for Projects Designed and Built by a Private Partner, by Type of Infrastructure and Financing**

The number of new highway, transit, and rail partnership contracts that include a design-build component increased in the late 2000s. Water utility partnership contracts that include a design-build component were more common in the late 1990s and 2000s than they are now.



Source: Congressional Budget Office, using data from the Federal Highway Administration and *Public Works Financing*.

For highway, transit, and rail projects, only projects with a value greater than \$50 million are included in this figure.

seen whether that project—which uses private financing—is the start of a new trend.

Although use of partnerships has grown, they are still only a small share of infrastructure spending in the United States. Between 1991 and 2016, the value of partnership contracts for highway projects was only about \$90 billion (in 2018 dollars), representing 2 percent of the approximately \$5 trillion that was spent on highways during that period by all levels of government.<sup>4</sup> Spending for transit partnerships accounted for 3 percent of spending over the same period. For water utilities, partnerships represented less than 1 percent of such spending.

Some analysts suggest that the use of partnerships may increase in the coming years.<sup>5</sup> Some public entities believe that using public-private partnerships to obtain financing will give them more flexibility to pursue projects because they can avoid the delays that may be involved in accumulating enough public funds or the limits that exist on public borrowing. Whether the growing number of potential projects will translate into sizable increases in the number of future partnerships is an open question.

### Expected Effects of Public-Private Partnerships

Public-private partnerships provide the private partner with incentives to improve a project or complete it more quickly or at lower cost than the public sector would. However, partnerships can also result in a reduction of public control and, in some cases, higher costs for users of the infrastructure. And although they can reduce the cost of an infrastructure *project*, partnerships do not reduce the cost of *financing*, when all costs are taken into account.

4. The value of a contract signed in a particular year sometimes differs from the amount of spending in that year for several reasons. For example, in some instances the value of a contract includes design and building activities that take more than a year to complete, and spending on operation and maintenance occur over a longer period. CBO includes 25 years of data on the value of contracts to minimize any discrepancies between contract value and spending.

5. Elaine Buckberg, Robert Mudge, and Hannah Sheffield, “Rising Tide of Next Generation U.S. P3s—and How to Sustain It,” (Brattle Group, February 2018), <https://tinyurl.com/y4vn7cbp> (PDF, 5.8 MB).

### Increased Efficiency

By combining stages and transferring risk, partnership contracts provide incentives to a private partner to be more efficient or provide higher quality than do traditional contracts.

**Information and Incentives.** Partnerships can facilitate quicker or cheaper completion of a project by bundling two or more elements of a project because information that would otherwise be known at only one stage is more likely to be shared among stages. A traditional contract does a relatively poor job of addressing the risks that arise from privately held or incomplete information. For example, having separate contracts for designing and building a facility exposes the project’s owner to constructability risk—the risk that the design produced will not be the most cost-efficient option to build or will not match the builder’s abilities.<sup>6</sup> If such a mismatch occurs, the project’s owner must first pay the builder to fix the resulting problem and then attempt to collect from the designer compensation for any added costs—which requires proving that the designer had legal liability because of a design that became more difficult and costly to complete than had been expected.

When the stages of an infrastructure project are consolidated under one project manager, that manager has an incentive to reduce the cost of the other stages of the project for which it is responsible. So a private partner that not only designs and builds but also operates and maintains a piece of infrastructure will be motivated to design it in a way that improves its long-term performance and reduces life-cycle costs (for example, by using more expensive but longer-lasting materials). Thus, when the same firm builds and maintains a project, it is motivated to use materials and methods to minimize costs over the life of a project, not just in its construction. Partnerships will be most cost-effective when the partner can realize substantial savings from keeping costs low over the life of the facility.

**Private Financing.** Including private financing in a public-private partnership in a way that transfers risk increases the incentive to reduce the project’s costs and

6. For further discussion, see, for example, Sidney Scott III and others, *Best-Value Procurement Methods for Highway Construction Projects*, National Cooperative Highway Research Program Report 561 (Transportation Research Board of the National Academies of Sciences, Engineering, and Medicine, 2006), <http://doi.org/10.17226/13982>.



shorten its schedule. When a private partner has an equity stake in a project, it has more incentive to control the costs or make it more valuable to users because the private partner will be able to keep revenues only if the cash flows are sufficient to cover costs. By contrast, a traditional contractor has less of an incentive to control costs or make the project more valuable to users because cost increases often can be passed on to the government, and the contractor will not benefit from a more useful project.<sup>7</sup>

A private partner that provides financing has a particular incentive to enhance the quality or otherwise improve users' experience when it bears demand risk—the risk that revenues from the infrastructure will be less than expected. Demand risk is allocated on the basis of how the partner is repaid. If the private partner collects user fees, it bears demand risk. If the private partner receives what are termed availability payments—installments from the state or local government that are made regardless of how much money the facility generates in fees—then the government bears demand risk. The state or local government that makes availability payments from user fees or from tax receipts that are not linked to the use of the facility does not transfer demand risk to the private partner.

When the private partner retains demand risk, that risk increases the shorter the contract is because the private party has less time to recover its investment. The state or local government could make the contract less risky by, for example, extending it for a longer period if broader economic conditions turned unfavorable for the private partner.<sup>8</sup>

The extent to which a financing contract transfers risk affects other terms in the contract. Private investors with an equity stake in a partnership will expect a rate of return equal to the return on other projects with similar risks. As a result, the riskier the project is for a private

investor, the more generous other terms have to be, such as the ability to charge higher user fees or receive greater tax incentives and other subsidies from the government. Because a private entity would be expected to enter into a partnership contract only if it expected to earn a return commensurate with the amount of risk that it took on, a transfer of risk that does not increase incentives to ensure the project's success results in no cost savings for the government, on average.

### Loss of Public Control

A drawback of a partnership arrangement for the public sector can be its loss of control over a project. For instance, some contracts for public-private partnerships turn over to the private sector the authority to set user fees. Higher highway tolls and water and sewer fees are likely to result, an outcome that threatens to conflict with other public-sector goals such as providing universal access to the infrastructure. A loss of control could also lead to conflicts between state or local governments and a private partner as well as costly renegotiations of the terms of the contract (or even legal proceedings). More generally, less control by the public partner makes it more expensive for a government to achieve future objectives; it also complicates efforts to adhere to a contract written many years—or even decades—earlier and still protect the public's interests.

Another disadvantage of the private operation and maintenance of infrastructure occurs when a private firm working under a fixed-term contract does not operate or maintain the facility in a way that extends its value beyond the end of the partnership contract, as would a public owner. Unless a partnership contract explicitly states that a facility must be managed to ensure its viability after the contract term, the private partner has no incentive to maintain the facility in a way that extends its value beyond that point.

### Cost of Financing

Partnerships can provide private partners with incentives to reduce the costs of an infrastructure project. However, those incentives do not affect the cost of the financing itself. Having a private partner provide financing lowers the government's up-front cost, but the private partner will expect to be repaid with future tax revenue or user fees. Even though the interest rates on tax-exempt municipal bonds are relatively low, ultimately the cost of the private financing itself is roughly equal to the cost of public financing when interest subsidies, the cost of risk, and transaction costs are accounted for.

7. Having a private partner make an equity investment in a project is not the only way to motivate contractors to manage projects efficiently. Governments can use the traditional approach in conjunction with other mechanisms to achieve the same ends, such as incentive payments or penalties that are contingent on the private contractor's meeting specific milestones for a project's costs or completion.

8. Eduardo Engel, Ronald Fisher, and Alexander Galetovic, "Finance and Public-Private Partnerships," in Alexandra Heath and Matthew Read, eds., *Financial Flows and Infrastructure Financing* (Reserve Bank of Australia, 2014), <https://tinyurl.com/y233baj9> (PDF, 297 KB).

**Interest Subsidies.** Interest rates charged on borrowing for infrastructure are often lower than on borrowing for other purposes, either because the interest paid on municipal debt is tax-exempt or because the federal government provides subsidies through federal credit programs in the form of lower-than-market rates. The full cost of interest on bonds issued by private borrowers is reflected in the interest rates on those bonds, but the same is not true for bonds issued by states and localities. The interest rate on private bonds is usually higher than the interest rate on governmental bonds and on qualified private activity bonds (QPABs)—a form of bond that pays tax-exempt interest when used for infrastructure and other public purposes. The interest rate on governmental bonds and QPABs is lower because the interest payments are exempt from federal income tax. As a result, federal taxpayers effectively subsidize those rates in the form of forgone revenues.<sup>9</sup> In addition, when a federal credit program provides a loan for a project at a subsidized rate, some of the project's costs shift from state and local taxpayers or the private partner to the federal government.<sup>10</sup> (Separate from the costs of financing, physical depreciation is a cost of ownership for public

and private partners; however, only the private partner can deduct the financial cost of depreciation; see Box 2.)

**Cost of Risk.** Infrastructure projects, whether built by a public or private entity, involve financial risks that the project might not perform as expected. That is, a project might be more expensive to build than projected, or demand for using the infrastructure might turn out to be less than expected. For instance, revenues from a public toll road might fall short of promised payments on a public bond, in which case the government would have to raise taxes or reduce spending in other areas to make up for the shortfall.

The risk that a project might not perform as well as expected must be borne by someone. In some partnerships, private equity investors take on the risk that revenues will be lower than anticipated and expect to earn a rate of return that compensates them for the financial risk they bear. When a project is publicly financed, most of the risk falls on taxpayers, and the cost of that risk is comparable to the amount that a private investor would require to bear it. State and local governments do not typically include the cost of risk as part of the cost of publicly financing infrastructure (although the cost of demand risk may be captured if revenue bonds are issued for a project, as discussed below). Nonetheless, state and local taxpayers will bear the cost if a project does not perform as planned.

The interest rates on some tax-exempt bonds do not incorporate the cost of the risks inherent in projects they finance. When bonds are backed by the government, which has the authority to raise taxes if a project does not bring in anticipated revenues, bondholders have generally not required higher interest rates because the risk of default is borne by taxpayers rather than the bondholder. By contrast, when a project uses revenue bonds, which are repaid by user fees and are often issued to finance investment in utilities, bondholders assume the risk that user fees will be unexpectedly low, so they require an interest rate high enough to compensate them for that risk.

When infrastructure is financed by public debt that is backed by the government, taxpayers are effectively equity holders: They benefit from greater-than-expected net revenues but also suffer from shortfalls in receipts or increases in costs. If revenues from user fees or taxes fall short of promised payments on that public debt,

9. Some of the value of the subsidy accrues to parties other than the issuer of the debt. For instance, bondholders in higher tax brackets can lower their tax liability by holding tax-exempt bonds. According to several studies, about 20 percent of the revenues that the federal government forgoes benefit bondholders (by reducing their tax liability) instead of benefiting the entity that issues the bond, thereby costing the federal government more than the subsidy that is provided to the issuer of the bond. See Congressional Budget Office and Joint Committee on Taxation, *Subsidizing Infrastructure Investment With Tax-Preferred Bonds* (October 2009), [www.cbo.gov/publication/41359](http://www.cbo.gov/publication/41359).

10. When the federal government provides loans or loan guarantees, federal budgetary rules do not capture all of the costs associated with the risk of losses that a private lender or guarantor would account for. In particular, the budgetary procedures prescribed by the Federal Credit Reform Act of 1990 do not account for the cost of market risk. Market risk is the component of financial risk that remains even after investors have diversified their portfolios as much as possible; it arises from shifts in macroeconomic conditions, such as productivity and employment, and from changes in expectations about future macroeconomic conditions. The government is exposed to market risk because resources become more highly valued when the economy as a whole is performing poorly; during such times, borrowers tend to default on their debt obligations more frequently and recoveries from borrowers are smaller. When the government extends credit, the associated market risk of those obligations is effectively passed along to taxpayers, who, as investors, would view that risk as having a cost.

## Box 2.

**Partnerships and the Depreciation Deduction**

By putting infrastructure assets under private ownership for tax purposes, a private partner benefits from tax deductions for depreciation in ways that a state or local government cannot. When a private entity claims a depreciation allowance for such assets, it reduces its tax payments. State and local governments can share in the gain from that reduction in tax liability when, as a result, they receive higher bids for a lease than they would otherwise.

Depreciation is the decline in the value of an asset through wear and tear or obsolescence, and for tax purposes, it is recognized through accounting methods that allow an asset's owner to recover the asset's cost over a number of years. Although the economic cost of depreciation of an asset is similar regardless of who owns it, the way that depreciation is accounted for provides a private entity that owns an asset with a tax benefit that is not available to a state or local government.

Businesses are allowed to deduct depreciation from their income before calculating their federal tax liability. By contrast, asset ownership by state or local governments does not provide

a similar benefit from the federal government because state and local governments do not pay federal taxes. In addition, to encourage private-sector investment, the federal government allows firms to accelerate, relative to the economic cost, a portion of the depreciation of their capital spending; depreciation schedules vary by type of asset. That treatment results in a greater share of investment costs being deducted from taxable income during the first year of use than would otherwise be the case and thus increases the value of the deduction.

A public-private partnership can allow a private partner to claim ownership for tax purposes of a road or other type of infrastructure and claim tax benefits (as it would if it owned the infrastructure outright). That can happen, for example, when the length of a long-term lease or management contract to operate and maintain infrastructure exceeds the expected remaining useful life of the infrastructure. Examples in the United States of arrangements that have conveyed ownership for tax purposes to private partners include the Chicago Skyway and the Indiana Toll Road.

the government must raise taxes or reduce spending to make up the difference. Similarly, if cost overruns or delays make a project more expensive and postpone its use, state and local taxpayers absorb those costs as well. A comprehensive measure of financing costs would take the cost of those risks into account, even when taxpayers bear them indirectly.

**Transaction Costs.** Financing an infrastructure project involves transaction costs, including the cost to issue bonds, the cost of monitoring and enforcing the terms of contracts, and any legal costs associated with obtaining financing. Some transaction costs differ depending on whether a project is publicly or privately financed, though such differences are generally small. For example, some states enjoy administrative economies of scale because they issue large volumes of bonds on a continuing basis. And some large private companies incur lower transaction costs for financing debt than state and local governments because the markets for private debt are more transparent and thus more liquid. Private bond markets are more stringently regulated than municipal

bond markets and have stronger disclosure requirements. As a result, risk is more transparent.

In addition to the cost of issuing bonds, states that choose private financing typically pay higher monitoring and legal costs than they would with traditional financing, although such costs generally account for only a small portion of total expenditures on a project. Partnership contracts contain many more provisions than traditional contracts, especially when private financing is involved. Complicated partnership contracts increase the chances that partners will disagree, thus increasing monitoring and legal costs.

**Experiences With Public-Private Partnerships**

Experiences with public-private partnerships over the past three decades largely bear out their expected effects and shed light on other results. One finding is that public-private partnerships are used differently depending on whether they are for roads, transit and rail systems, or water utilities. For example, highway and other transportation partnerships often assigned

Table 2.

**Value of Transportation and Water Utility Projects Designed and Built by a Private Partner, 1991 to 2016**

Billions of 2018 dollars

Highway	Value of Contract	Transit and Rail	Value of Contract	Water Utility	Value of Contract
<b>Projects Without Private Financing</b>					
All Projects (84 total)	45.8	All Projects (50 total)	33.3	All Projects (62 total)	9.5
Average	0.5	Average	0.7	Average	0.2
Largest Projects		Largest Projects		Largest Projects	
Tappan Zee Bridge (N.Y.)	3.4	Dulles Metrorail Phase 1 (Va.)	3.2	Stockton (Calif.) Combined	0.8
I-15 Reconstruction (Utah)	2.1	Hudson–Bergen Light Rail (N.J.)	2.9	Ft. Meade Army Post (Md.) Combined	0.8
State Highway 130, Segments 1 to 4 (Tex.)	1.9	Jamaica–JFK Airtrain (N.Y.)	1.5	Phoenix (Ariz.) Lake Pleasant Water	0.4
<b>Projects With Private Financing</b>					
All Projects (41 total)	36.7	All Projects (4 total)	9.4	All Projects (19 total)	3.3
Average	0.9	Average	2.3	Average	0.2
Largest Projects		Largest Projects		Largest Projects	
I-635 LBJ Freeway (Tex.)	3.2	Miami–Orlando Rail (Fla.)	3.7	San Antonio (Tex.) Water	0.8
I-4 Ultimate Managed Lanes (Fla.)	2.5	Purple Line Rail Transit (Md.)	2.8	Cranston (R.I.) Wastewater	0.6
North Tarrant Express (Tex.)	2.4	Denver Eagle P3 Rail (Colo.)	2.3	Chicago (Ill.) Wastewater	0.3
<b>All Public-Private Projects</b>					
All Highway Projects (125 total)	82.5	All Transit/Rail Projects (54 total)	42.7	All Water Utility Projects (81 total)	12.8
Average	0.7	Average	0.8	Average	0.2

Source: Congressional Budget Office, using data from *Public Works Financing*.

For highway, transit, and rail projects, only projects with a value greater than \$50 million are included in the table.

the design-build stages of activity to the private partner, whereas water utility partnerships more frequently focused on operation and maintenance.

The use of private financing in partnerships also varied depending on the type of infrastructure. Partnerships for highways have provided private financing more often than partnerships for other kinds of transportation and water infrastructure. Forty-one of the 125 highway projects constructed through design-build public-private partnerships between 1991 and 2016 (the most recent year for which comparable data for all infrastructure types were available) involved private financing (see Table 2).<sup>11</sup> Over the same period, just 4 of 54 design-build transit and rail partnerships and 19 of 81 water

utility partnerships that included a design-build component also included financing. Such disparities among partnerships have resulted in different benefits, risks, and limitations for each.

Research has shown some positive effects for highway and water utility partnerships. However, the data are limited. Moreover, problems with particular partnerships have limited their use in other places, including concerns over the loss of public control and difficulties with anticipating contingencies in contracts. Some governments have found other ways to improve projects without using public-private partnerships.

**Highways**

Projects without private financing that were designed and built by a private partner were completed a little more cheaply and slightly more quickly, on average, than projects that used the traditional approach. Although partnerships that used private financing have helped

11. Data from *Public Works Financing*, a monthly newsletter that reported on public-private partnerships for roughly 25 years before it ceased operations in 2018. The newsletter reported data on highway and transit projects if they had a value of \$50 million or more.

some states accelerate financing in some situations, bankruptcies, cancellations, and delays have been risks of that approach. Perhaps as a result, in recent years the sources of revenues designated to repay the private partner have involved less risk for the private partner.

**Partnerships Without Private Financing.** Studies indicate that, compared with the traditional approach, public-private partnerships have slightly reduced the time required to complete the design and building phases of road projects and lowered construction costs by a small amount, on average.<sup>12</sup> Over the 1991–2016 period, the value of highway partnerships without private financing was \$46 billion (expressed in 2018 dollars). For projects with contracts valued at more than \$100 million, the total time required to design and build the road proved less than originally estimated by as much as a year on some projects—in part because, by bundling the design and building contracts, the partnership eliminated a second, separate bidding process for the additional tasks. Some studies estimated that the cost of building roads was in the range of 3 percent to 4 percent lower than it would have been for comparable roads provided in the traditional way. However, estimating the time savings or cost savings from public-private partnerships is difficult for several reasons: Public data are limited; how the experience would have been different without the public-private partnership is uncertain; and estimates of savings are uncertain.<sup>13</sup>

One opportunity to assess the effects of public-private partnerships on operation and maintenance costs for highways has come from two older highways that were originally built in the traditional way, the Chicago Skyway and the Indiana Toll Road. Those roads were converted to private management when they were leased

by companies in the mid-2000s, and both projects experienced reductions in costs afterward.<sup>14</sup> However, other factors in addition to the transfer of control, such as the 2007–2009 recession and the associated reduction in traffic, probably contributed to the reduction in operation and maintenance costs. Further complicating the analysis, the Chicago Skyway lease was later sold (for substantially more than its initial price) and the leaseholder of the Indiana Toll Road declared bankruptcy.

**Partnerships With Private Financing.** Partnerships that include private financing probably sped up the financing process and made funds available earlier than would have been the case with public financing. But in some cases, private financing resulted in bankruptcies for the private partner or other undesirable outcomes. Over the 1991–2016 period, the value of highway partnerships with private financing was \$37 billion (expressed in 2018 dollars). On the basis of information from the Federal Highway Administration through November 2019, the value of such partnerships has increased over time: About five-sixths (\$33 billion) went to projects that began construction after 2008. Roughly a third of the total value (\$12 billion) applies to projects that are still under construction. (For lists of completed and ongoing highway projects with private financing, their funding, and the source of repayments to the private partner, see Table 3 and Table 4.)

*Effects on States' Financing.* Private financing probably expedited projects in states or localities with budgetary limits or legal constraints that limited their ability to spend or to issue debt. A total of 28 states require a vote of the people or legislature on tax-exempt bond financing backed by general revenues, and state constitutions or statutes in 40 states limit the amount of outstanding bonds by placing limits on issuance directly or by limiting debt service costs.<sup>15</sup> Over time, three of the states that both require a vote and place limits on issuance—Florida, Texas, and Virginia—implemented most of the highway partnerships with private financing (about 75 percent by contract value). The private financing probably sped up financing of those road projects and allowed the public to benefit from the new roads sooner.

12. Congressional Budget Office, *Using Public-Private Partnerships to Carry Out Highway Projects* (January 2012), [www.cbo.gov/publication/42685](http://www.cbo.gov/publication/42685). For a recent review of the literature, see Andrew Brazeale and others, “Collected Hypotheses Concerning Benefits of Highway Public Private Partnerships” (Department of Transportation, Volpe National Transportation Systems Center, November 2016), <https://trid.trb.org/view.aspx?id=1438817>.

13. Zhenhua Chen, Nobuhiko Daito, and Jonathan Gifford, “Data Review of Transportation Infrastructure Public-Private Partnership: A Meta-Analysis,” *Transport Reviews*, vol. 36, no. 2 (2016), pp. 228–250, <https://doi.org/10.1080/01441647.2015.1076535>. For additional details, see Congressional Budget Office, *Using Public-Private Partnerships to Carry Out Highway Projects* (January 2012), pp. 22–24, [www.cbo.gov/publication/42685](http://www.cbo.gov/publication/42685).

14. Congressional Budget Office, *Using Public-Private Partnerships to Carry Out Highway Projects* (January 2012), pp. 24–25, [www.cbo.gov/publication/42685](http://www.cbo.gov/publication/42685).

15. Pew Charitable Trusts, *Strategies for Managing State Debt* (June 2017), <https://tinyurl.com/y9exa50d>.



Table 3.

**Completed Highway Partnerships With Private Financing**

	Start and End of Construction	Sources of Revenues	Bankruptcy Declared?	Public Bought Out Private Partners?	Sources of Funding (Millions of 2018 dollars)					Private Equity's Share of Funding (Percent)	Total Cost of 2018 (Millions of 2018 Dollars)
					Private		Publicly Supported				
					Debt	Equity	TIFIA Loan	Qualified Private Activity Bonds <sup>a</sup>	Other <sup>b</sup>		
Dulles Greenway (Va.)	1993–1995	Tolls	No	No	503	65	0	0	0	11	568
SR-91 Express Lanes (Calif.)	1993–1995	Tolls	No	Yes	175	35	0	0	0	17	212
Camino Columbia Bypass (Tex.)	1997–2000	Tolls	Yes	No	104	21	0	0	0	17	125
Atlantic City–Brigantine Tunnel (N.J.)	1998–2001	Tolls/taxes	No	No	169	0	0	0	327	0	496
Southern Connector (S.C.)	1998–2001	Tolls	Yes	No	283	0	0	0	0	0	283
Pocahontas Parkway (Va.)	1998–2002	Tolls	No	No	751	0	0	0	0	0	751
Route 3 North (Mass.)	2002–2005	Taxes	No	No	552	0	0	0	0	0	552
South Bay Expressway (South Section; Calif.)	2003–2007	Tolls	Yes	Yes	458	240	190	0	0	27	888
I-495 HOT Lanes (Va.)	2008–2012	Tolls	No	No	0	407	689	689	635	17	2,419
SH-130 (Segments 5 and 6; Tex.)	2009–2012	Tolls	Yes	No	803	248	503	0	0	16	1,555
I-595 Merged Lanes (Fla.)	2009–2014	Tolls/taxes	No	No	902	251	697	0	269	12	2,120
North Tarrant Express (Segments 1 and 2; Tex.)	2010–2014	Tolls	No	No	0	492	751	460	663	21	2,367
Port of Miami Tunnel (Fla.)	2010–2014	Taxes	No	No	395	93	395	0	357	7	1,240
I-635 LBJ Freeway (Tex.)	2011–2015	Tolls	No	No	0	776	984	701	567	26	3,027
I-95 HOV/HOT Lanes (Va.)	2012–2014	Tolls	No	No	0	309	331	279	99	30	1,019
Presidio Parkway (Calif.)	2012–2015	Taxes	No	No	181	50	163	0	0	13	396
Elizabeth River Tunnels (Va.)	2012–2018	Tolls	No	No	0	300	466	745	794	13	2,306
Ohio River Bridges East End Crossing (Ind.)	2013–2016	Tolls/taxes	No	No	0	84	176	552	620	6	1,433
U.S. 36 Managed Lanes (Colo.)	2013–2016	Tolls	No	No	23	23	64	21	92	10	222
Goethals Bridge (N.Y.)	2014–2018	Tolls/taxes	No	No	0	115	505	483	453	7	1,557
North Tarrant Express (Segment 3A; Tex.)	2014–2018	Tolls	No	No	0	472	560	290	171	32	1,491
Southern Ohio Veterans Highway (Ohio)	2015–2018	Taxes	No	No	0	52	221	265	146	8	681
Rapid Bridge Replacement (Penn.)	2015–2019	Taxes	No	No	0	63	0	839	280	5	1,182
I-77 HOT Lanes (N.C.)	2015–2019	Tolls	No	No	0	262	199	105	104	39	671

Source: Congressional Budget Office, using data from the Federal Highway Administration.

“Tolls” refers to payments collected by the private partner, whereas “taxes” and “tolls/taxes” refer to revenues collected by the government, which then pays the private partner.

HOT = high-occupancy vehicle or toll; HOV = high-occupancy vehicle; TIFIA = Transportation Infrastructure Finance and Innovation Act.

a. A private activity bond is a bond issued by or on behalf of a local or state government to finance a private business’s project.

b. Mostly loans or grants from states or localities.

Although private financing allowed states to borrow money sooner than they might have otherwise, the borrowed funds still have to be repaid with future revenues that are then unavailable for other purposes. For projects with newly instituted tolls, some observers argue that those tolls would not have been collected without

the involvement of the private partner because the tolls would have been politically unpopular. In CBO’s assessment, however, tolls collected by a private partner could just as well be collected by a government entity, and in fact a number of projects exist in which public entities

Table 4.

**Ongoing Highway Partnerships With Private Financing**

	Start and Expected End of Construction	Sources of Revenues	Sources of Funding (Millions of 2018 dollars)					Private Equity's Share of Funding (Percent)	Total Cost (Millions of 2018 Dollars) <sup>c</sup>
			Private		Publicly Supported				
			Debt	Equity	TIFIA Loan	Qualified Private Activity Bonds <sup>a</sup>	Other <sup>b</sup>		
I-4 Ultimate (Fla.)	2015–2021	Tolls/taxes	515	110	1,336	0	1,102	4	3,063
SH 288 Toll Lanes (Tex.)	2016–2020	Tolls	0	391	388	312	19	35	1,109
I-395 Expressway (Va.)	2017–2020	Tolls	0	183	0	257	127	32	566
I-66 Outside the Beltway (Va.)	2017–2022	Tolls	0	1,559	1,257	754	238	41	3,808
Central 70 (Colo.)	2018–2022	Tolls/taxes	0	66	455	121	629	5	1,271
I-95 Express Lanes Fredericksburg (Va.)	2019–2022	Tolls	0	210	0	277	0	43	487
I-75 Modernization Segment 3 (Mich.)	2019–2022	Taxes	50	47	0	610	693	3	1,400

Source: Congressional Budget Office, using data from the Federal Highway Administration.

“Tolls” refers to payments collected by the private partner, whereas “taxes” and “tolls/taxes” refer to revenues collected by the government, which then pays the private partner.

TIFIA = Transportation Infrastructure Finance and Innovation Act.

a. A private activity bond is a bond issued by or on behalf of a local or state government to finance a private business's project.

b. Mostly loans or grants from states or localities.

c. Some values may include costs in future years that are not adjusted for inflation by the source.

collect tolls not to retain them but to pass them on to private partners in the form of availability payments.

*Risks.* The risk that investors and lenders took on in helping to finance infrastructure projects was realized when several such projects went bankrupt or were bought out by public partners (see Table 3 on page 15).

Bankruptcies represented losses to private equity holders, and in some cases, they resulted in losses to those who provided debt financing, including bondholders (if bonds were part of the financing) and the federal government (if federal loans were involved). At the same time, however, the users of the roads benefited even as the private entity was restructured or the facility was bought out by either the public partner or a different private entity.

For example, the private partner on a highway in Austin, Texas (State Highway 130), received a loan from the Transportation Infrastructure Finance and Innovation Act (TIFIA) program, which is the largest direct federal credit program for transportation infrastructure. The partner filed for bankruptcy in 2016. As part of the reorganization, which was finalized in 2017, the federal

government received an equity stake in the new operator of the toll road, a reduction in debt exposure, and a cash payment.<sup>16</sup> Whether the federal government will fully recover its costs related to the TIFIA loan remains to be seen.

A few years earlier, the South Bay Expressway in San Diego, which received financing from a federal credit program, also illustrated ways in which federal taxpayers bear risk as equity holders.<sup>17</sup> The project was supported by a TIFIA loan. The private partner filed for Chapter 11 bankruptcy in March 2010, emerging in April 2011. At that time, the new financing and ownership structure required by the bankruptcy court replaced the original TIFIA investment with a package of secured

16. William J. Mallet, *Risks and Rewards of Transportation Public-Private Partnerships (P3s), With Lessons From Texas and Indiana*, CRS Report IF10735 (Congressional Research Service, September 19, 2017), <https://go.usa.gov/xpSzM> (PDF, 397 KB).

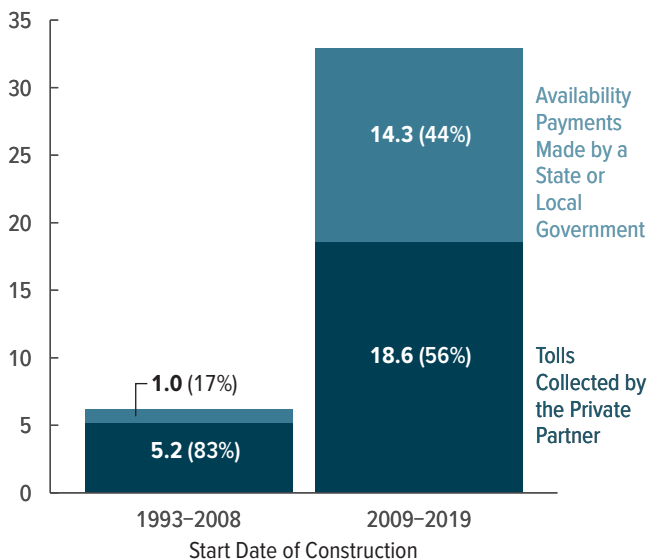
17. For more information on TIFIA and other federal sources of support for infrastructure financing, see Congressional Budget Office, *Federal Support for Financing State and Local Transportation and Water Infrastructure* (October 2018), [www.cbo.gov/publication/54549](http://www.cbo.gov/publication/54549).

Figure 3.

### Repayments for Highway Partnerships With Private Financing, by Source of Repayment

After 2008, private financing was repaid with availability payments—which the private partner receives from the state or local government regardless of a project’s revenues—more often than it had been earlier. The change reduced private partners’ share of risk and increased the share of risk carried by the public partner.

Billions of 2018 Dollars



Source: Congressional Budget Office, using data from the Federal Highway Administration and *Public Works Financing*.

Data for 2019 are through November.

debt and equity worth only 58 percent of the original investment.<sup>18</sup> Since then, toll revenues have increased. After the federal government sold its equity stake and had its remaining debt repaid, the series of transactions resulted in roughly a full recovery of the original federal loan balance.

In an instance that shows how state and local taxpayers also can bear risk as a result of a partnership with private financing, California entered into such a partnership in the early 1990s to expand its State Route 91. To increase the expected return of the private investors, the contract restricted the state’s ability to build or expand competing roadways. However, after travel demand in the area later increased, the state ended up buying out the private

partner at a premium in order to build more roads to alleviate congestion.

Private financing also carries the risk of cancellations. Over the past 10 years, several highway projects in the United States involving private financing were canceled, reverting to state or local control and resulting in delays.<sup>19</sup> A recent example was the I-69 project in Indiana: The state canceled the contract and took control of the project in August 2017, after it fell behind schedule by two years and one of the partners went bankrupt.

*Trends in the Terms of Partnerships.* As companies and governments gained experience with private financing, partnerships were increasingly structured in different ways. One of the main trends was to reduce the risk borne by the private partner. That was accomplished by relying more heavily on availability payments. Many partnerships for projects that began before 2009 relied on tolls charged by the private party for repayment, and availability payments from the state or local government were uncommon, occurring for only a few projects. Those private partners that overestimated the traffic and revenues that a project would generate and could not repay their project’s debt faced bankruptcy, and subsequently private partners were less willing to enter into agreements without availability payments.

After the 2007–2009 recession, partnerships relied less frequently on tolls. Availability payments grew more common, which reduced the risk for the private partner, although they still accounted for a minority of the funds for projects. For partnerships with private financing that began after 2008, about 44 percent of the \$33 billion (in 2018 dollars) in costs was guaranteed by availability payments. Of the \$6 billion (in 2018 dollars) in highway projects with private financing before that date, 17 percent was guaranteed by availability payments (see Figure 3).

Another shift occurred in the way projects were financed. Partnerships initially used large shares of unsubsidized private debt for financing. (Only a small share of the financing was publicly subsidized in the early years.) After some private partners struggled to make the sizable

18. Randall Jensen, “Tollway Exits Chapter 11,” *Bond Buyer* (May 5, 2011), <http://tinyurl.com/3fn8nvj>.

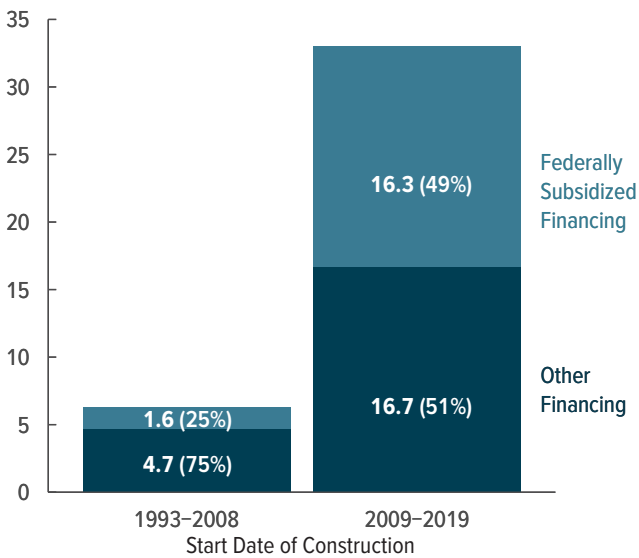
19. “P3s Are Like Pinatas—Perhaps,” *Public Works Financing* (June 2016), vol. 316, pp. 2–6. See also Department of Transportation, *Transportation Infrastructure Finance and Innovation Act: 2014 Report to Congress* (2014), <https://go.usa.gov/xpjq9>.

Figure 4.

### Financing for Highway Partnerships With Private Financing, by Share That Is Federally Subsidized

The share of federally subsidized financing used in partnerships doubled after 2008. The result of that change has been to increase the cost and risk borne by federal taxpayers.

Billions of 2018 Dollars



Source: Congressional Budget Office, using data from the Federal Highway Administration and *Public Works Financing*.

Data for 2019 are through November.

Federally subsidized financing includes loans made under the Transportation Infrastructure Finance and Innovation Act and qualified private activity bonds, as detailed in Tables 3 and 4. Other financing may include loans from state infrastructure banks, which also receive federal support.

interest payments on that debt when toll revenues did not meet projections, the use of unsubsidized private debt declined. Before 2009, the federal government subsidized 25 percent of the financing for such projects through TIFIA loans or tax-preferred debt. After 2009, that share grew to 49 percent (see Figure 4). Since then, partnerships have frequently replaced or augmented unsubsidized private debt with federally subsidized financing. In short, the private party's share of funding and risk decreased, and the costs to federal taxpayers and the government's implicit equity and risk increased.

The division of risk among private investors, state and local governments, and the federal government in federally supported financing depends in part on whether the financing is repaid using tolls or availability payments.

The more risk that states take on by offering availability payment contracts, the lower the probability of default on the TIFIA loans by private borrowers. A lower probability of default results in less risk being borne by the federal government when it provides the loans. As a result, the more risk that states take on by offering availability payment contracts, the lower the projected cost to the federal government of providing TIFIA loans to private partners. Similarly, the more risk that states take on by offering availability-payment contracts, the less risk private partners take on with QPABs. In one case in which a contract with the private partner was terminated by the state, holders of QPABs were repaid by the public entity.<sup>20</sup> For projects repaid with tolls, the private partner (and ultimately the holders of QPABs) are fully at risk in case of insufficient revenues because the private partner is solely responsible for debt service and the public entity serves only as a conduit for the financing.<sup>21</sup>

Projects in which the private partner directly received toll revenues typically used more private equity than those in which the partner received availability payments. After 2009, the share of private equity increased to 28 percent, on average, for projects that collected tolls (see Figure 5). Projects whose costs are repaid with availability payments have tended to use smaller amounts of private equity (less than 10 percent, on average), instead relying more heavily on government grants.

### Other Transportation Facilities

Most other transportation partnerships have relied less on private financing than highway partnerships have. Those transportation partnerships without private financing are typically design-build partnerships. For example, the expansion of the Metro's Silver Line in Northern Virginia to Dulles Airport is being paid for

20. See Robert Poole, Jr., *Availability Payment or Revenue-Risk P3 Concessions? Pros and Cons for Highway Infrastructure*, Reason Foundation (November 2017), <https://tinyurl.com/y8tn3cb5>; and Jodi Hecht, "I-69 Termination—What Went Wrong and How to Fix the P3 Model," *Public Works Financing* (July–August 2017), pp. 15–20.

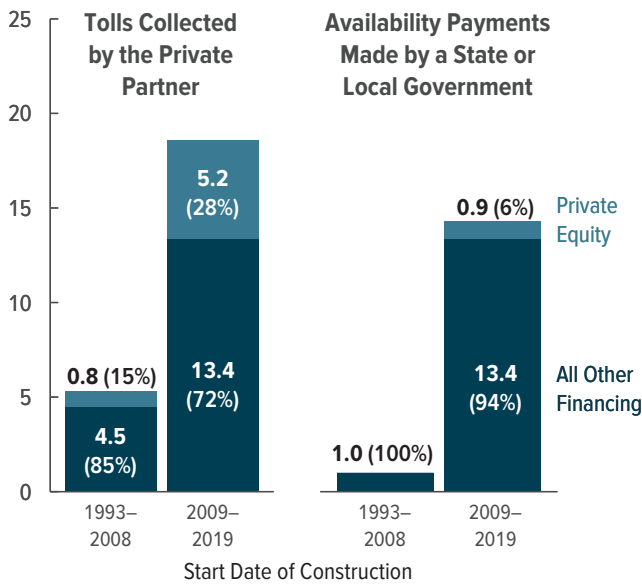
21. That is, the government (the "conduit issuer") issues bonds on behalf of the private borrower (the "conduit borrower"), which is responsible for interest and principal payments on the bonds and receives the benefit of tax-exempt financing for those bonds. See Congressional Budget Office, *Subsidizing Infrastructure Investment With Tax-Preferred Bonds* (October 2009), p. 12, [www.cbo.gov/publication/41359](http://www.cbo.gov/publication/41359). For more, see Justin Cooper, *Conduit Financing With Tax-Exempt Bonds* (Orrick, Herrington & Sutcliffe LLP: September 2017), <https://tinyurl.com/y6ytj2kc>.

Figure 5.

### Sources of Financing for Highway Partnerships With Private Financing

Privately financed partnerships that collected tolls used private equity at twice the rate after 2008 that they had before, whereas partnerships that received availability payments—which the private partner receives regardless of a project’s revenues—used much less private equity than partnerships that collected tolls.

Billions of 2018 Dollars



Source: Congressional Budget Office, using data from the Federal Highway Administration and *Public Works Financing*.

Data for 2019 are through November.

with roughly \$6 billion of public financing from federal, state, county, and airport authority funds, including roughly \$2 billion in TIFIA loans.<sup>22</sup>

The handful of projects that include private financing are recent, and some are not finished. The types of transportation facilities that have been privately financed include commuter rail, light rail, and airport facilities. As with recent highway partnerships that use private financing, those partnerships often use federally subsidized QPABs in addition to other sources of financing, along with small shares of private equity.

- A \$2 billion agreement to design, build, finance, operate, and maintain privately financed commuter

rail facilities in Denver, Colorado, used a \$1 billion federal grant from the Federal Transit Administration along with other federal, state, and local funds. The financing drew on \$400 million in QPABs and a TIFIA loan of \$280 million. The private partner, which provided \$54 million in equity, is being repaid with availability payments. The last of the facilities opened earlier this year.

- The Purple Line, a new light-rail system in Maryland outside Washington, D.C., involves a public-private partnership contract to design, build, finance, operate, and maintain the system. The contract is valued at \$5.6 billion over the life of the agreement. The state will provide most of the resources for the project, and the federal government is contributing \$900 million in grants. The project is also supported by \$300 million in QPABs and \$900 million in TIFIA loans. The private partner is providing \$140 million in equity. Construction began in 2017. The private partner is receiving progress payments for construction costs and will receive availability payments once the system is operating.
- A new rail station, the Moynihan Train Hall in New York City, will augment the facilities at Penn Station by providing access to platforms and tracks with a redevelopment of the Farley Post Office Building. The \$1.9 billion project involves having a private developer design and build the facility and operate it under a long-term lease. Financing terms include \$785 million in capital contributions from a variety of sources, including the Empire State Development Corporation, Amtrak, the Port Authority of New York and New Jersey, and the Metropolitan Transportation Authority, as well as a \$526 million TIFIA loan. The developer, which is providing \$230 million, will receive revenues from the commercial facilities in the hall, including retail and office space. Construction started in 2017.
- A terminal at John F. Kennedy Airport in New York was privately financed in 1997, and construction of a new terminal at nearby LaGuardia Airport that used some private financing began in 2016. The \$4.2 billion LaGuardia terminal is being designed and built by a private consortium, which will also manage the terminal under a 35-year lease. The project will rely on about \$1 billion in funds from passenger facility charges collected by the Port Authority at the airport as well as roughly

22. See Federal Highway Administration, “Project Profile: Dulles Corridor Metrorail Project” (accessed April 27, 2019), <https://go.usa.gov/xpJ3r>.



\$600 million in contributions from the Port Authority. The financing arrangements also include \$2.4 billion in QPABs. The consortium contributed \$200 million in private equity.

- Denver International Airport reached agreement in 2017 on financing for a \$1.8 billion partnership to redevelop its main terminal. The financing included funds from government sources as well as \$189 million in QPABs and \$73 million in equity. The private partner was to receive progress payments for construction costs and share in the concession revenues from the terminal. However, disputes over the existing condition of the terminal and delays in the project led to the termination of the partnership in 2019. The private partner is being paid for the investment it made in the project plus a return on that investment as a termination payment, and the airport is looking to hire a new contractor to complete the project.

### Water Utilities

Unlike highway partnerships, which have mostly transferred the design-build stages of a project to a private partner, partnerships for water utilities have primarily relied on the private partner to improve the operation and maintenance (and sometimes the physical condition) of existing facilities. Relatively few partnerships have included private financing.

In 2016, private water companies received an estimated \$1.9 billion (in 2018 dollars) to design, build, operate, or maintain water utilities for municipalities and the federal government (in particular, for combined water and wastewater systems on military bases). The bulk of those revenues came from contracts of eight or more years, long enough in CBO's assessment to transfer a substantial amount of risk to the private partner and be considered here as public-private partnerships. Almost all those payments were for operating and maintaining water utilities, with less than \$100 million coming from design-build services.

Although evidence suggests that water utility partnerships have lowered operation and maintenance costs and improved compliance with regulatory standards, those data are subject to several qualifications that make it difficult to draw clear conclusions from them. In contrast to highway partnerships, the number of new partnerships for water utilities with a design-build component has

gone down since 2009, probably reflecting experience with some contracts that turned out poorly and the availability of other options to improve utilities' performance.

**Partnerships Without Private Financing.** For almost two decades, private-sector revenues from water utility partnerships have been fairly flat in inflation-adjusted terms (see Figure 6). However, the types of partnerships have changed: Revenues from operation and maintenance partnerships have been growing, and recent contracts have been of shorter duration, decreasing the amount of risk shifted to the private sector. Meanwhile, revenues from design-build services have fallen sharply (after adjustment for inflation), from a yearly average of \$225 million in the 1998–2008 period to \$129 million thereafter.<sup>23</sup>

The number of partnerships for water utilities jumped after 1997, when the IRS allowed governments to sign fixed-fee utility management contracts of up to 20 years' length with the private sector.<sup>24</sup> Previously, private firms could commit to cost savings in shorter-term contracts but, because they had a limited time to realize savings from their actions, they usually made only minor changes. Because the 1997 ruling allowed private firms

23. Yearly revenues from all public-private partnerships that provide operation and maintenance for water utilities (see Figure 6) are considerably larger than the value of the contracts that include a design-build component (see bottom panel of Figure 1 on page 7). Although the value of contracts incorporates the future revenues expected to be earned over the life of the project, the annual revenues for partnerships with water utilities that provide only operation and maintenance (that is, those that are purely management contracts) are greater because the number of such partnerships far exceeds the number that combine operation and maintenance with design-build services.

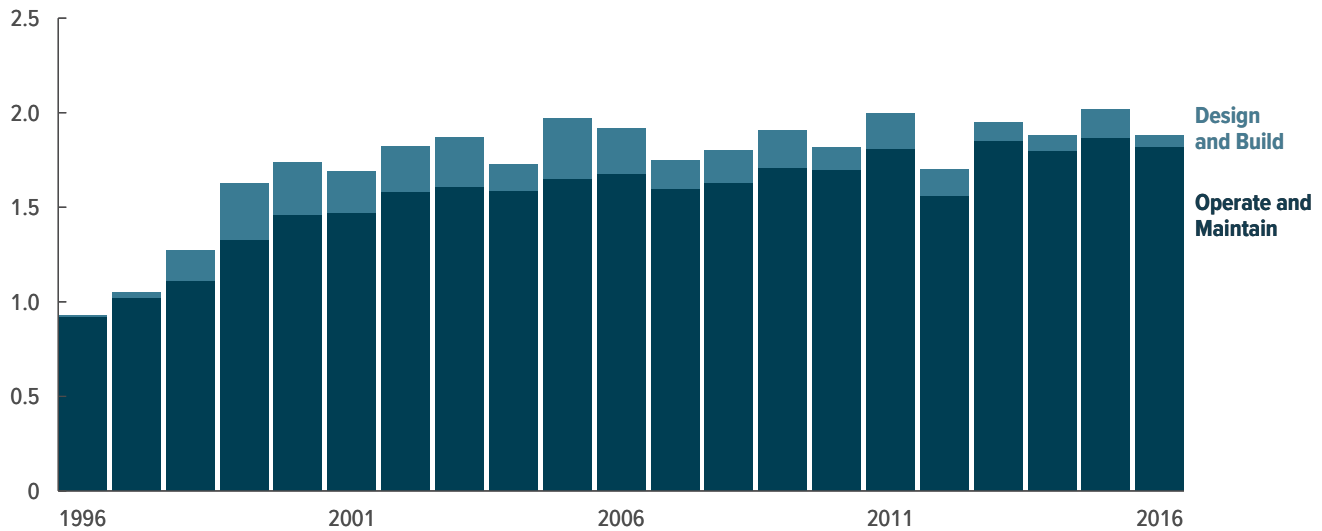
24. See Rev. Proc. 97-13, 1997-1 C.B. 632, modified by Rev. Proc. 2001-39, 2001-2 C.B. 38. Before 1997, contracts of up to five years were allowed (with minimum fixed-fee compensation of 50 percent); however, because the government owner of the facility could terminate the contract after three years, the time horizon for the private firm's participation was considerably shorter than the five-year maximum. Inherent in the 1997 regulation was a transfer of risk to the private sector: The more the private firm's compensation took the form of a fixed fee, the longer the allowable contract length (up to 20 years). In 2016, the IRS relaxed its regulation of private-sector utility management contracts with utilities that issued tax-exempt debt by removing the link between a private firm's share of compensation through fixed-fee payments and the allowed contract length and by extending the maximum contract length to 30 years for all facilities (see Rev. Proc. 2016-44, 2016-2 C.B. 316).

Figure 6.

**Private Partners’ Revenues From Water Utility Partnerships, by Type of Work Performed**

For almost two decades, private partners’ revenues from water utility contracts have been fairly flat in inflation-adjusted terms. Private partners have mostly conducted operation and maintenance under those contracts.

Billions of 2018 Dollars



Source: Congressional Budget Office, using data from the Federal Highway Administration and *Public Works Financing*.

For highway, transit, and rail projects, only projects with a value greater than \$50 million are included in this figure.

a substantially longer time horizon to recoup their expenses, they could apply their experience and expertise to make far-reaching changes to water utilities in order to reduce costs.<sup>25</sup> (In some cases, private firms conveyed a portion of those future cost savings to the government owner of the utility in the form of an up-front, or concession, payment.) A contract of roughly eight or more years is generally long enough for the private operator to recoup its expenses from making substantial changes to a utility—including modest capital expenses. Of course, longer contracts carry a greater risk for the private firm, including the possibility that unexpected and costly

operational and compliance issues will arise. Recently, management contracts have been shorter.<sup>26</sup>

*Research Findings.* The research literature on partnerships for water utilities includes only a handful of studies, some decades old, and the number of utilities in most of the studies is often quite small, between two dozen and three dozen.<sup>27</sup> Given those caveats, the studies

25. Although operation and maintenance contracts for water utilities can now be longer, they are not as long as some leases for highways. For example, the leases for the Indiana Toll Road and the Chicago Skyway were for 75 and 99 years, respectively. The much longer period allows the private partner to take advantage of depreciation allowances that enable it to reduce its federal income tax liability. At the same time, such a lengthy lease exposes a private firm to more risk because forecasting 75 years of future revenues from tolls is harder than predicting 20 years of costs from operating and maintaining a water utility.

26. See Lewis D. Solomon, *America’s Water and Wastewater Crisis—The Role of Private Enterprise* (Transaction Publishers, 2011).

27. See Patrick Cairo and Christopher Frangione, “An Evaluation of Public-Private Partnerships for Water and Wastewater Systems,” *World Environmental and Water Resources Congress* (American Society of Civil Engineers, 2006), [https://doi.org/10.1061/40856\(200\)312](https://doi.org/10.1061/40856(200)312) (PDF, 975 KB); Gary Wolff and Eric Hallstein, *Beyond Privatization: Restructuring Water Systems to Improve Performance* (Pacific Institute, December 2005), <https://tinyurl.com/y4cfaacq>; Hudson Institute, *The NAWC Privatization Study: A Survey of the Use of Public-Private Partnerships in the Drinking Water Utility Sector*, (National Association of Water Companies, June 1999); and Janice A. Beecher, G. Richard Dreese, and John D. Stanford, *Regulatory Implications of Water and Wastewater Utility Privatization* (National Regulatory Research Institute, 1995), <https://tinyurl.com/yyqgwu97> (PDF, 21 MB).

have generally found benefits to partnerships. The most recent example of such research, a 2004–2005 survey of public entities that engaged private firms to operate and maintain their water utilities—under both short- and long-term contracts, with an average contract length of nine years—found that compliance with EPA regulations improved in three-fourths of cases and that cost savings were realized in the roughly one-half of cases where they had been projected for the partnership before its creation. Similar cost savings were reported in another survey of about 100 public-private partnerships that were established by the end of 2016: Of those partnerships that quantified cost savings, the savings ranged between 10 percent and 50 percent of the costs budgeted by the public agency.<sup>28</sup>

The earliest studies (those before 2000) looked not only at partnerships but at all participation by the private sector, from simple outsourcing contracts to public-private partnerships to full privatization. Those studies in general found similar benefits for a range of activities.<sup>29</sup>

Another positive indicator of partnerships for water utilities is how frequently contracts with the private sector

were renewed: Of the contracts that came up for renewal in 2016 (including some that were too short for CBO to consider them public-private partnerships), 87 percent were re-signed with the private firm operating and maintaining the utility, and another 7 percent were signed with a different private firm. Operation and maintenance reverted to the government owner upon the contract's expiration for only 4 percent of expired water utility contracts. Renewal rates were consistently high in earlier years as well, indicating that municipalities were typically satisfied with private-sector operation and maintenance of their water utilities.<sup>30</sup>

*Applicability of Research.* Analysts have debated whether those studies are representative of what utilities may expect from a public-private partnership. Some analysis emphasizes that partnerships will not necessarily be good for all water utilities because large differences among water utilities are not captured by the limited data.<sup>31</sup> That concern applies even to some of the later studies, where the number of observations is greater. In the 100-partnership sample, for example, about one-quarter of the partnerships studied indicated they realized cost savings. However, the other three-quarters provided no information about costs, and some partnerships for which cost information was not reported may have been established for reasons other than reducing expense, such as improving regulatory compliance. Moreover, because the recent trend has been toward shorter contracts with fewer opportunities to realize cost savings, estimates that rely on longer contracts from earlier years may overstate the savings from future partnerships. Finally, because most of the partnerships surveyed included design and construction as well as operation and maintenance services, it is not possible to draw conclusions about the potential cost savings from partnerships that entailed only long-term operation and maintenance services.

**Partnerships With Private Financing.** State and local governments have shown little interest in private financing because federal tax regulations allow a private entity to assume long-term responsibility for a water

28. See “U.S. Water Partnerships Scorecard—Communities With Long-Term Contracts,” *Public Works Financing* (June 2017), pp. 6–7; and Patrick Cairo and Christopher Frangione, “An Evaluation of Public-Private Partnerships for Water and Wastewater Systems,” *World Environmental and Water Resources Congress* (American Society of Civil Engineers, 2006), [https://doi.org/10.1061/40856\(200\)312](https://doi.org/10.1061/40856(200)312) (PDF, 975 KB).

29. See Hudson Institute, *The NWAC Privatization Study: A Survey of the Use of Public-Private Partnerships in the Drinking Water Utility Sector* (National Association of Water Companies, June 1999); and Janice A. Beecher, G. Richard Dreese, and John D. Stanford, *Regulatory Implications of Water and Wastewater Utility Privatization* (National Regulatory Research Institute, 1995), <https://tinyurl.com/yyqgwu97> (PDF, 21 MB). In contrast to the findings of those studies, reviews of published research on the cost savings achieved primarily by privately owned water utilities—which are not considered to be public-private partnerships under the definition used in this report—have found mixed results; see Germà Bel and Mildred Warner, “Does Privatization of Solid Waste and Water Services Reduce Costs? A Review of Empirical Studies,” *Resources, Conservation and Recycling*, vol. 52, no. 1 (October 2008), pp. 1337–1348, <https://doi.org/10.1016/j.resconrec.2008.07.014>; and Steven Renzetti and Diane Dupont, “Ownership and Performance of Water Utilities,” *Greener Management International* (Summer 2003), pp. 9–19, <https://www.jstor.org/stable/greemanainte.42.9>. One reason the results are mixed is the difficulty of comparing private and public costs given the different tax regulations for each type of utility.

30. See “PWF’s Annual Water Outsourcing Report,” *Public Works Financing* (June 2017), p. 11. However, the operation and maintenance contracts in question included both short-term and long-term contracts. Only long-term contracts entail a degree of risk transfer that is characteristic of a public-private partnership.

31. See Gary Wolff and Eric Hallstein, *Beyond Privatization: Restructuring Water Systems to Improve Performance* (Pacific Institute, December 2005), <https://tinyurl.com/y4cfaacq>.

utility—including capital projects—without compromising the tax-exempt status of the municipal owner’s debt. As a result, state and local governments can issue tax-exempt bonds for a water utility partnership, which is less expensive for state and local taxpayers than the increases in user fees and other costs associated with private financing, without taking into consideration the costs of federal interest rate subsidies, risk, and transaction costs. Consequently, the values of design-build contracts for water utilities are much lower than those for transportation, especially water utility contracts with private financing (see Figure 1 on page 7).

Other restrictions on private borrowing also tend to limit private financing of water projects. Although a private partner could finance a water utility project with QPABs, those bonds have more restrictions than municipal tax-exempt bonds.<sup>32</sup> For instance, although interest payments on QPABs are also tax-exempt, the interest payments on many QPABs—including those issued to finance water and wastewater facilities—are subject to the alternative minimum tax, making them less attractive to investors.<sup>33</sup> In addition, if the proceeds from issuing a QPAB are used to acquire structures or equipment that are already in use, then a significant share of them must be spent on rehabilitation—thus reducing the proceeds that could be used for expanding the facility. QPABs for water and wastewater investment are also subject to state-specific volume caps; indeed, advocates for water utilities argue that states set aside an insufficient amount of their permitted QPAB volume each year for water and wastewater investment. Finally, by federal law, QPABs can be used to finance investment in a drinking water facility only if a governmental entity operates the facility, or sets or approves its rates; no such requirement exists for wastewater facilities.

Despite those obstacles, some municipalities choose public-private partnerships with financing for water utilities. For example, in one of the nation’s largest water utility partnerships to date, San Antonio, Texas, used

private financing to substantially expand the water supply for the city’s drinking water system.<sup>34</sup>

The Water Infrastructure Finance and Innovation Act of 2014 (WIFIA) has resulted in additional federal support for water utility partnerships that include private financing.<sup>35</sup> Among other things, WIFIA authorizes the EPA to provide credit assistance (either direct loans or loan guarantees), typically of up to 49 percent of eligible project costs, to private water utility projects that are sponsored by a governmental entity. Such projects include public-private partnerships that use private financing. Altogether, EPA has provided about \$3.5 billion in credit assistance under the program.<sup>36</sup> WIFIA also authorizes the Army Corps of Engineers to provide credit assistance for water resource projects, including public-private partnerships that use private financing. However, the Congress has not appropriated funds to the Corps to administer the program.<sup>37</sup> So far, experience with the program is too limited to allow a conclusion about whether it will lead to a significant increase in private financing of water utility projects.

**Limitations.** Negative experiences with some past water utility partnerships suggest several possible reasons partnerships have not been more common, despite their benefits. First, utilities sometimes drew public ire when they did not maintain control of fees for water and wastewater services. Second, several past partnerships drew up contracts that did not cover all of the contingencies inherent in running a water utility. Third, municipalities found ways to improve their utility’s performance that did not require them to form a partnership.

*Control Over Fees.* One reason water utilities do not partner with private companies more often is that

32. The examples of restrictions that follow are drawn from 26 U.S.C. §§57, 142, 146, and 147 (2012 & Supp.).

33. Public Law 115-97, enacted in December 2017 and originally called the Tax Cuts and Jobs Act of 2017, significantly increased an individual’s exemption before his or her income is subject to the alternative minimum tax. That change may have increased the attractiveness of QPABs to investors beginning in 2018.

34. For further discussion of prospects for public-private partnerships for water utilities, see American Water Works Association and Ernst & Young, *To P3 or Not to P3* (2019), pp. 13–14, <https://tinyurl.com/y238gjtj>.

35. 33 U.S.C. §3901 et seq. (2012 & Supp.).

36. Environmental Protection Agency, “EPA Announces \$436 Million Loan to the Indiana Finance Authority to Support Water Infrastructure Projects Across the State” (accessed October 18, 2019), <https://go.usa.gov/xpSum>.

37. For more information on WIFIA and other federal sources of support for infrastructure financing, see Congressional Budget Office, *Federal Support for Financing State and Local Transportation and Water Infrastructure* (October 2018), [www.cbo.gov/publication/54549](http://www.cbo.gov/publication/54549).

municipalities want to control the pricing of water and wastewater services. Clean drinking water and sewerage are often viewed as basic goods that contribute broadly to public health and should be available to everyone. Municipalities may be concerned that water and wastewater fees would increase as a result of a greater private-sector role and that, as a result, low-income households would find it difficult to purchase those services. (Some contracts with the private sector have limited how much rates can change in the future.) Higher water and wastewater treatment fees were also a concern when utilities were fully privatized because state regulators allowed the private entity to increase rates—even when those rates incorporated a subsidy from general tax revenues.<sup>38</sup>

In 2012, residents of Bayonne, New Jersey, protested when their water rates increased as a result of a partnership, after they were promised that rates would not rise for four years. However, instead of following through on that commitment, a new city administration allowed the rates to escalate.

*Problems With Contracts.* A second deterrent to public-private partnerships is the challenge of formulating a contract that satisfies all parties. The experiences of Atlanta, Georgia, and Stockton, California, illustrate how difficult it can be to determine the condition of older water systems and to anticipate the costs to improve them.

38. Food & Water Watch, *The State of Public Water in the United States* (February 2016), <https://tinyurl.com/y3z31ryg>.

Atlanta created a public-private partnership in 1999 for its drinking water system, but the contract was ended 16 years early—by mutual consent of the city and the private utility operator—because of dissatisfaction with the contract’s specifications. Neither party accurately assessed the poor condition of Atlanta’s drinking water system, the amount of repair it needed, or the revenues necessary to fund the repairs. The parties also did not clearly establish their respective obligations under the contract.

Stockton was required by the courts to take back operation of its water utility only a few years after it entered into a partnership because the city had not conducted an environmental assessment. As in Atlanta, Stockton’s private partner underestimated its eventual expenses. In addition, many customers complained about the private partner’s management of the system.

*Other Options.* Finally, municipalities do not choose partnerships because they have other ways to improve their water utility. For example, municipalities can realize scale efficiencies by consolidating water or wastewater services with other localities, which allows each municipality to retain some control over its utility. Municipalities can also join with adjacent local utilities to hand over responsibility and control for their water or wastewater systems to a regional agency or authority.<sup>39</sup>

39. See Gary Wolff and Eric Hallstein, *Beyond Privatization: Restructuring Water Systems to Improve Performance* (Pacific Institute, December 2005), <https://tinyurl.com/y4cfaacq>.





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## About This Document

This report was prepared in response to a request from the Ranking Member of the Senate Finance Committee. In keeping with the Congressional Budget Office's mandate to provide objective, impartial analysis, it contains no recommendations.

Nathan Musick and Chad Shirley wrote the report with guidance from Joseph Kile and assistance from Pranav Bhandarkar of CBO and David Wylie, formerly of CBO. Useful comments were provided by Kim Cawley, Michael Falkenheim, Sebastien Gay, Mark Hadley, John McClelland, David Newman, Aurora Swanson, and David Torregrosa of CBO and Sarah Puro, formerly of CBO. Janice Beecher of Michigan State University, Kevin DeGood of the Center for American Progress, Robert Poole of the Reason Foundation, and William Reinhardt of Public Works Financing also provided helpful comments. The assistance of external reviewers implies no responsibility for the final product, which rests solely with CBO.

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CBO continually seeks feedback to make its work as useful as possible. Please send any comments to [communications@cbo.gov](mailto:communications@cbo.gov).

A handwritten signature in black ink, appearing to read "Phillip L. Swagel".

Phillip L. Swagel  
Director  
January 2020