A Study of Public-Private-Partnership Practices and Fiscal Integrity in the U.S.

2017. 12.

Board of Audit And Inspection

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1.Introduction

Reducing government's fiscal burden is the basic reason for introducing Public-Private-Partnership(PPP) while supplying social infrastructure. However, in the process of developing PPP projects in Korea, there has been many cases in which PPP have caused excessive fiscal burden for central and local governments. As the Minimum Revenue Guarantee(MRG) system has been abolished, the possibility of serious fiscal burdens regarding PPP has been reduced. However, government's financial burdens regarding PPP, such as construction subsidy in construction stage or user fee in operation stage, are still enormous. And if these funds are overly or ineffectively enforced, there is a possibility of hindering the fiscal integrity of governments. In this regard, it is meaningful to review the case of the U.S. where there is a long history regarding PPP.

For many transportation agencies in the United States, public-private-partnerships (PPP) offer an opportunity to tap new financing sources and transfer certain project delivery risks. These partnerships differ from standard procurement practice wherein the public sponsor controls each phase design, construction, finance, operation and maintenance of the project's lifecycle. In a PPP, a single private entity (which may be a consortium of several companies) assumes responsibility for multiple phases, accepting long-term risks in return for prospective rewards. Transportation PPP often feature user fees or tolls, but the concept applies as well to projects funded with traditional government resources committed via long-term contract, known generally as availability payments.[1] As public entities and private developers create new

1) An Availability Payment is a payment for performance regardless of demand or use.

arrangements to deliver, operate and maintain transportation services, PPP in the U.S. continue to evolve. This report focuses on long-term concession agreements where, in addition to project design and construction, the private partner is at least partly responsible for financing and bears most or all responsibility for operations and maintenance, an arrangement typically called Design-Build-Finance -Operate-Maintain (DBFOM).

Because most public agencies that engage in PPP are at the State government level and because enabling legislation is passed at the State level this report will refer mostly to States.

The increasing use of Public-Private Partnerships (PPP) concessions as a delivery option for complex highway projects in the US has been facilitated through a wide range of financial, technical and policy initiatives undertaken by the US Department of Transportation (USDOT). Many reports and case studies have been developed and disseminated relating to individual PPP projects. This report attempts to identify trends and synthesize the U.S. experience with the evolving use of highway PPP concession projects and the Federal involvement with them.

This report gives an overview of PPP practices in the U.S. This includes the characteristics of each types of PPP and revenue mechanism of DBFOM model. And then, this report review the general frame of PPP program. The framework follows the process of legislation, project development, procurement and monitoring.

In addition, This Report on PPP assesses and synthesizes the experience of the 28 highway PPP concession projects that have

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Availability requires to be open for full public use while meeting specific performance, safety and quality standards.

been implemented in the U.S. since 1992. The report assesses trends and market developments that have occurred over the baseline horizon for three different groups of PPP:

- ▶ Real Toll Concessions
- ▶ Availability Payment Concessions
- ▶ Long-Term Leases

The report analyzes how the use of different financing strategies and procurement structures have evolved over time, focusing in particular on the use of Federal financial tools and related approvals.

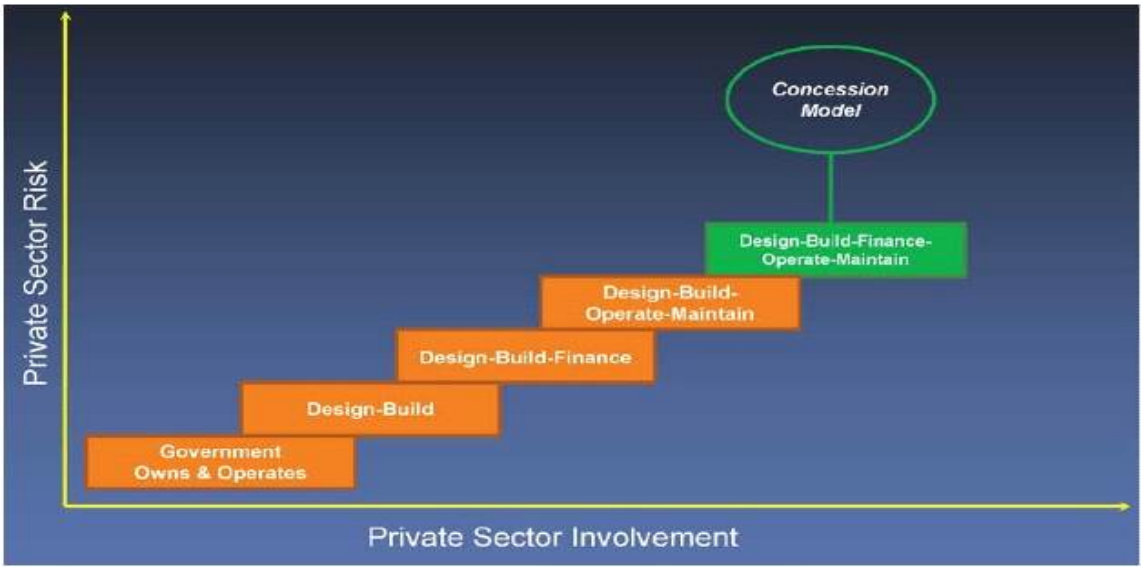
2. Overview of PPP Practices in the U.S.

2.1. Project Types of PPP

Public-private Partnerships (PPP) are contractual agreements between public agencies and private entities that provide greater private participation in the delivery and financing of transportation projects compared to the traditional design-bid-build public procurement model. Under the traditional approach, project sponsors execute separate contracts for the design of projects and then for their construction, and then they operate and maintain the infrastructure following construction.

There are many different forms of PPP. Transportation PPP arrangements range from design-build procurements, where design and construction services are grouped into a single, fixed-price contract, to concessions, where a private investor/operator is responsible for financing, designing, constructing, operating, and maintaining new highway projects in exchange for the right to collect the revenues generated by the project or availability payments from the public sponsor for the duration of the concession period. As shown in Figure 1, the primary distinction between them is the specific responsibilities and level of risk that is assumed by the private partner.

Figure 1: Spectrum of PPP Procurement Options and Risk Exposure



2.1.1 Design-Build

Design-build is a project delivery method that combines design and construction functions into a single contract, rather than as two independent services performed consecutively by separate entities. With design-build procurements, owners execute a single, fixed-fee contract for both architectural/engineering services and construction. The design-build entity□also known as the constructor□may be a single firm, a consortium, joint venture or other organization assembled for a particular project. With design-build delivery, the design-builder assumes responsibility for completing a final design for projects and undertaking construction activities for a fixed fee. As such, the design-builder also assumed the financial risks associated with possible cost overruns. Most design-build contracts also include penalties for schedule delays and bonuses for the early completion of construction. The project sponsor remains responsible for financing the project, and operates and maintains it after construction is complete.

Design-build procurements are often used with large and complex projects. Because they are fixed price agreements, design-build contracts incentivize the design-builder to innovate and identify strategies to streamline construction costs. Project completion can also be accelerated by undertaking some design and construction activities concurrently rather than sequentially, as is the case with design-bid-build projects. This has the potential to result in further cost reductions by shielding projects from the risk of inflation and commodity cost escalations. Project designs are generally 10 to 30 percent complete at the time most design-build procurements are let, and design-build procurements contain comprehensive performance requirements that the bidder's final design must meet. This structure provides the design-builder with the flexibility to innovate and find the most cost-effective solutions both in terms of project design and construction techniques.

The award of design-build contracts is made on a best value basis that takes price and technical quality as well as the qualifications of the bidding teams into consideration. Under the right conditions, design-build procurements can result in cost reductions compared to the traditional design-bid-build approach and can accelerate the completion of projects.

2.1.2 Design-Build-Finance

With the design-build-finance (DBF) procurement model, one contract is awarded for the design, construction, and full or partial financing of a facility. Responsibility for the long-term maintenance and operation of the facility remains with the project sponsor. This approach takes advantage of the efficiencies of design-build procurements and also allows the project sponsor to defer paying all or a part of the cost of the project during construction.

With DBF procurements, the constructor agrees to provide all or some of the construction financing. The design-builder is repaid with milestone and/or completion payments made by the project sponsor. These arrangements are typically short term and extend no more than a few years beyond the construction period. Responsibility for the long-term maintenance and operation of the facility remains with the project sponsor.

Project sponsors generally use DBF procurements to overcome cash flow constraints or out of a desire to defer paying for projects. With some DBF procurements, the owner identifies the current amount of available project funding and requires the design-builder to finance any development costs in excess of that amount for a specified period of time. In other cases, an owner may specify the maximum amount that it can pay a design-builder each year for a project. That specified amount and the cost of the project would determine the length of the repayment period.

Private sector design-builders may provide self-financing and front their own implementation costs until the sponsor is able to pay them. They may also borrow money using existing commercial credit liens, or arrange project-specific financing. In addition to all the potential benefits of design-build procurements, the DBF approach allows project sponsors to accelerate the construction of projects that they would otherwise have to wait to procure until they had amassed the required funding. DBF procurements are being used with increased frequency to deliver a broad range of projects.

2.1.3 Design-Build-Operate-Maintain

The design-build-operate-maintain (DBOM) model is an integrated partnership that combines the design and construction responsibilities of design-build procurements with operations and maintenance. These project components are procured from the private sector in a single contract with financing secured by the public sector. DBOM procurements provide project sponsors with all the potential benefits of the design-build project delivery method. In addition, by bundling the operation of projects with their design and construction, these procurements incentivize the private partner to apply cost-saving, life-cycle costing principles to align the design of the project with long-term maintenance needs.

DBOM procurements require private sector bidders to prepare cost estimates that include maintenance activities for the duration of the contract. To do so, bidders must develop tailored maintenance plans that anticipate needs and streamlines long-term maintenance costs. This process may result in developing a more robust and costly design, in order to reduce ongoing maintenance costs throughout the operations period. For owners, the lifecycle cost approach also shields important maintenance needs from the uncertainties of future budget cycles.

The DBOM project delivery approach is also known by a number of different names, including "turnkey" procurement and build-operate-transfer.

2.1.4 Design-Build-Finance-Operate-Maintain

Under the DBFOM procurement approach, the responsibilities for

designing, building, financing, maintaining and operating are bundled together and transferred to private sector partners. Also known as □concessions,□ DBFOM procurements provide project sponsors with the cost and acceleration benefits of design-build procurements and the added lifecycle benefits of the DBOM approach. In addition, they transfer financial risk to the private sector partner and provide owners with access to new sources of financing, including private sector equity.

There is a great deal of variety in DBFOM arrangements in the United States, especially the degree to which financial responsibilities are actually transferred to the private sector. One commonality that cuts across all DBFOM projects is that they are financed by debt leveraging revenue streams dedicated to the project. The following section provides additional information on the different DBFOM concession models.

2.2 Revenue Mechanism of DBFOM Concession Model

Two different revenue sources have been used to leverage financing for DBFOM concessions. The majority of existing DBFOM concessions use toll revenues to raise project financing. Since 2009, a growing number of DBFOM concessions have been financed using annual availability payments paid by the project sponsor to the private partner. The financing raised from both of these revenue streams is also often supplemented by grants from project sponsors and other contributions, such as right-of-way or complementary construction projects. These two concession models are discussed in further detail in the following sections.

2.2.1 Real Toll Concessions

DBFOM projects leveraging toll proceeds are commonly referred to

as □real toll□ concessions. With these arrangements, the private sector partner maintains the right to collect toll revenues during the concession period but bears the risk that toll proceeds may not meet forecasted levels. With real toll concessions, the private sector partner assumes the risk that the funds generated by the project may not be adequate to pay the underlying project loans and interest and make a fair return on its investments of time, expertise and equity. To protect the public sector interest in the event of robust revenue generation, some concession agreements include a revenue-sharing provision between the private partner and public sector if revenues exceed certain specified thresholds.

The real toll concession model has been used to develop three different types of projects in the U.S.

- ▶ Greenfield Toll Roads: these projects involve the construction of toll roads in travel corridors that did not previously have highway facilities. Because they lack established traffic volumes dating back in time, traffic and revenue risk is high with these projects. When they are developed on a PPP concession basis, this significant risk is transferred to the private sector partner.

- ▶ Waterbody Crossings: these projects consist of tolled bridge or tunnel waterbody crossings. They may involve the construction of crossings in entirely new corridors, or the expansion of capacity in existing crossing corridors. In some cases, these facilities may be built within a single jurisdiction; in others, they may join adjacent municipalities, States, or even countries. In cases with multi-jurisdictional crossing projects, there may be differing PPP legislation and policies that influence the procurement and financing of the project.

- **Priced Managed Lanes**: These facilities are designated lanes or roadways within highway rights-of-way where the flow of traffic is managed by restricting vehicle eligibility, limiting facility access, and collecting variably priced tolls. Toll rates may vary in real time based on actual traffic conditions or according to a fixed schedule. The toll rate is used to meter the flow of paying vehicles on the lanes in order to maintain a desired level of operation and predictable travel times. Traveling on priced managed lanes can provide motorists with significant travel time savings in congested urban and suburban commuter corridors. Traffic and revenue forecasting for these projects is complex and involves assumptions about the value of time under different circumstances. However, these projects tend to be built in established highway corridors where extensive information is available on historic traffic volumes.

2.2.2 Availability Payment Concessions

With availability payment DBFOM concessions, the project sponsor retains all toll revenue risk if the facility is tolled. The sponsor pledges availability payments to compensate the concessionaire for its role in designing, constructing, operating, and maintaining the facility for a set time period during which it receives fixed annual payments. Availability payments are often used for projects that are not tolled. Owners make the availability payments to their private partners from public funds and they must be prioritized ahead of other needs throughout the concession period. The availability payments may be secured from a revenue pledge or subject to appropriations. When they involve the construction of toll facilities, the public sponsor may apply the toll proceeds to the cost of the annual availability payments.

The ongoing annual availability payments are dependent on the private partner's meeting operational performance standards, including lane closures, incident management, or snow removal. If the private partner does not meet the required standards, the amount of the availability payment is reduced. Availability payments transactions may also include milestone payments during construction or a one-time completion payment when construction is finished.

2.2.3 Long-term Lease Concessions

In addition to the construction of new facilities, project owners can also use the concession approach to lease existing toll facilities to a private partner. Known as long-term lease concessions, these arrangements involve the lease of existing, publicly financed toll facilities to a private sector concessionaire for a prescribed concession period in exchange for an upfront lease payment (i.e., a concession fee). The private partner then has the right to collect tolls on the facility for a specified concession period. The private partner must operate and maintain the facility over the life of the concession period and in some cases make improvements to it. Much like the financing structure of DBFOM transactions, private investors raise financing for these sizeable concession fees by leveraging future toll proceeds generated by the leased facilities.

Long-term leases are procured on a competitive basis, with awards going to the qualified bidder making the most attractive offer to the sponsoring agency. The most important criterion for the award of a long-term lease concession generally is the amount of the concession fee. Other criteria may include the length of the concession period and the credit worthiness and professional qualifications of the bidders.

3. General Framework of PPP Program

This chapter is organized four phases of PPP program/project development: ① legislation and policy, ② project development, ③ procurement, and ④ performance monitoring and oversight. This framework has been used in many U.S. DOT[2] reports addressing PPP, and represents one approach to organizing successful practices. Given the chronological nature of this framework, however, potential trade-offs and cross-cutting issues may not be readily apparent. Nevertheless, these trade-offs are discussed throughout the report.

3.1. Legislation and Policy

Enabling legislation provides the framework for designing and delivering projects through a PPP and provides public agencies with the legal authority to enter into a PPP. Enabling legislation: 1) sets conditions for PPP; 2) provides a framework for contracts between a public agency and private partner; and 3) allows for risk transfer between parties. Conditions determined by legislation include: allowable types of PPP and revenue and payment mechanisms. Additionally, PPP policy is used to guide public agencies in their implementation of PPP projects and, possibly, a PPP program. This policy must be consistent with the PPP-enabling legislation and other existing policy including, for example, a region's long-range transportation plan. Policies provide specific guidance on project development including project selection, funding, and management.

2) U.S. Department of Transportation

Because most public agencies that engage in PPP are at the State government level, enabling legislation is passed at the State level.

Many States have crafted unique PPP legislation that reflects their own priorities and circumstances. State-enabling legislation can also include limits on the type of transactions, the duration of transactions, the number or location of projects, the project selection and review process, disclosure and transparency guidelines, setting toll rate controls, and assigning rights to non-toll road routes. In some instances, States have developed similar legislative approaches.

PPP-enabling legislation provides a framework for the executive branch of a government to implement a PPP and create policies necessary for implementation. Some issues, for example structuring a State's PPP transaction environment, are well suited to being addressed in legislation. Other issues such as those related to defining the executive body's capabilities in implementing a PPP are addressed through policies. Finally, issues typically addressed through contracts relate to the specifics of a proposed PPP project. The parameters for contract negotiations are typically set through policy or enabling legislation.

3.1.1. PPP Legislations among States

Given a conducive Federal legislative environment for PPP, States have begun to consider and pursue alternative options for delivering transportation infrastructure apart from the traditional model of municipal bonds and government grants. Putting in place legislation to enable PPP is the first step towards allowing a PPP project or PPP program to be developed and implemented. If

a State intends to use Federal funds to pay for part of its PPP projects, State-level PPP legislation must also fit within the Federal PPP legal framework.

Recent experience with PPP varies widely among States. Some have mature PPP programs and have implemented a large number of projects. In 1989, California became the first State to adopt specific PPP-enabling legislation. Six years later, Virginia adopted PPP legislation with its comprehensive *Public-Private Transportation Partnership Act*. Overall functions and relevant examples of PPP legislations are like below.

Function 1: Allow for a Variety of PPP Options in Legislation

State governments determine which delivery methods, including PPP options, are appropriate for the delivery of their transportation infrastructure. PPP-enabling legislation typically addresses key issues that affect the scope of PPP within a State. Enabling legislation can allow for a variety of PPP options, including types of PPP structures (e.g., DBFOM, DBF, etc., as discussed in Section 1.3), allowable revenue and payment mechanisms (as discussed in Section 1.4), and allowable financial instruments. PPP legislation that provides for a range of delivery options maximizes flexibility for the public agency and can provide a greater degree of certainty for the private sector.

Example: The State of Texas

In Texas, PPP legislation authorizes the use of a wide range of PPP structures for the delivery of road, highway and rail projects. Many delivery options are allowed, such as DB, DBB, and DBFOM. Each has been used by the State's Strategic Project Division to deliver high-value projects over the years. The use of

availability payments is not permitted.

Texas has developed legislation, per Chapter 223 of the Texas Transportation Code, allowing the State and regional governments to enter into flexible Comprehensive Development Agreements (CDAs) with a private entity. By design, CDAs are adaptable to the particularities of a project. They allow for delivery options such as DB, DBB, and DBFOM, based on project circumstances. Furthermore, to procure work under CDAs, the State can issue RFPs but can also receive and accept unsolicited proposals. Since Texas enacted its flexible PPP–enabling legislation, the State has closed PPP transactions worth approximately $12 billion.20 The adaptable nature of CDAs in Texas has been an important feature of the State's PPP program.

Function 2: Create a Centralized Unit with Specialized Skills to Implement PPP Transactions

Although most State DOTs have robust policies and processes for completing projects through traditional procurement, PPP project procurement requires specialized skills including expertise in risk allocation, private financing, and concession contracting that are not typically found in DOTs. Agencies that have pursued a pipeline of PPP projects have found that implementation through a centralized PPP unit is helpful. Centralizing implementation of PPP project delivery within a Statewide team with technical, financial, and legal expertise has been beneficial to the delivery of PPP projects.

Organizationally, PPP units can be centralized within or outside of a State DOT. In either case, it is crucial for the unit to have the authority and expertise to deliver PPP projects. An effective PPP staff has technical expertise, project management skills,

procurement training, as well as commercial and financial backgrounds. It is also very helpful for other State agencies, such as finance and legal (e.g., through the State's budget division and attorney general), to assign the right individuals to work with the PPP unit; this helps those departments understand the impact of PPP projects, and it centralizes the knowledge in dedicated staff members.

Example: Commonwealth of Virginia

The Commonwealth of Virginia's Office of PPP (VAP3) reports to the Commonwealth's Secretary of Transportation. The mission of VAP3 is to identify, develop, procure and implement a Statewide program for project delivery under the 1995 Public-Private Partnership Transportation Act (PPTA) that is consistent with the transportation goals of the Commonwealth.

The VAP3 staff develops multimodal solutions consistent with State, regional, and local policies, plans, and programs and encourages competition for private sector investment. VAP3 staff is also responsible for developing, publishing, and using standardized procedures and policies. As such, VAP3 published the 2014 PPTA Implementation Manual and Guidelines to provide guidance on project identification, screening, development, procurement and implementation of PPP projects. Additionally, it outlines guidance regarding the legal, organizational, reporting, and funding framework of VAP3. VAP3 has produced guidance on VfM analysis, risk management, and public engagement. VAP3 has published a pipeline of potential PPP projects, which is updated annually (the latest is from 2013), available online, and is developed through a public involvement process.

Function 3: Enable PPP Authority to Set Policy and Contract Terms

Even with broad and flexible PPP legislation, many aspects of PPP implementation are best resolved through policy actions and contractual agreements. When infrastructure is delivered through a PPP, the complexity typically increases, requiring flexible policies and contracts. Therefore, it is desirable that a PPP–enabling legislation provides the State DOT or PPP authority the ability to set policy and contract terms.

Legislation should largely place the control of policy development and contract negotiations in the hands of the designated PPP authority, whether within or outside the State's DOT. Matters such as the mechanics of project identification and screening are typically best handled through public policy guidelines developed by the relevant PPP authorities. This is also the case for contract terms that may need to be flexible to accommodate the particularities of projects. Overly prescriptive legislative requirements may impede the development of the flexible policy measures necessary to successfully implement a PPP project or program. State procurement rules, such as small business goals, typically apply to PPP, although the legislation can also provide waivers for PPP projects, depending on the State's policy priorities. The PPP legislation should take into account the potential impact of existing State regulations on PPP projects and address potential conflicts.

Function 4: Establish Upfront Legislative Involvement and Approvals for PPP Projects

Some States have legislation requiring that the legislature review or

approve any project that is delivered via a PPP. Legislative provisions that allow for entities other than the project sponsor to review or approve of PPP projects are intended to protect the public interest. However, if approvals occur late in the process, it can result in higher costs for both public and private partners due to the uncertainty involved in the provision.[3] Uncertainty regarding project approvals can make private partners less willing to incur proposal development costsor pursue PPP projects. Involving legislators and other entities upfront in the PPP project development process can help to alleviate this uncertainty. In general, if legislative approval is desired for PPP projects, it is more effective to require them as early in the development process as possible and ideally before the private sector becomes heavily engaged.

Clarification of the level and extent of legislative involvement can be further complicated in States with self-help counties, such as California. In California, there is strong local control by statute where counties have funding authority for transportation infrastructure, for example, Measure R funding the Los Angeles County Metropolitan Transportation Authority. However, a Statewide transportation agency, Caltrans, has title to transportation facilities, but cannot propose PPP projects or act as the project sponsor because it does not control the funding mechanism. It is important to take into account the individual State's structure for legislative decision making for PPP and find a balance between the public sector's need for input and private sector's need for certainty.

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3) FHWA, Challenges and Opportunities Series: Public Private Partnerships in Transportation Delivery.
http://www.fhwa.dot.gov/ipd/pdfs/feedback_forum/challenges_and_opportunities.pdf.

3.1.2. PPP Policy

A legal framework is only the foundation for the implementation of a PPP project or program. Most legislation leaves policy development to an appointed entity, typically a State's DOT.

Establishing clear PPP policies and guidelines demonstrates what the government plans to do with its PPP program and projects and how it plans its implementation. Clear PPP policies help to minimize confusion and risk for all parties by making government actions more predictable. This section describes successful practices related to establishing clear PPP policies and provides key points and examples.

Function 1: Educate Stakeholders and Cultivate Political Support

PPP projects include structures and concepts that differ from traditional procurement. This can lead to misconceptions about PPP for elected officials, agency staff, and the general public. Education on what PPP are, how they are structured, and their costs and benefits is key to obtaining public support and buy-in and can clarify any misconceptions.

Obtaining public approvals and political support can be facilitated when stakeholders fully understand the PPP structure and project proposedincluding the costs and benefits. During interviews with sponsoring agencies, private entities, and stakeholder groups, the following concepts related to PPP were raised as needing additional education: ownership structures, risk transfer, responsiveness to public needs, the justification of profit-making of private partners, and revenue generating mechanisms. These concepts generally are not included in traditional public

infrastructure projects.

Function 2: Seek Early Public Approvals and Stakeholder Input

A key concern articulated by many private partners is the unpredictability of public agency decision-making. Intervention by the government particularly at a late stage can derail projects, and thereby wasting public and private time and resources. However, input from agency staff and the general public is necessary to ensure that projects delivered through PPP meet public needs. PPP policies can address these competing concerns at the program level by balancing the private sector's need for assurances with the desire to incorporate public decision-making. Allowing for robust public deliberation and participation through early agency approvals (separate from legislative approvals) and stakeholder input is a successful practice that not only reduces changes at a late stage but also increases transparency.

Function 3: Create a Pipeline of PPP Projects

In the case of States that are considering multiple projects for PPP delivery, an organized project list (pipeline) sends a strong, positive signal to the private sector about the public agency's commitment to PPP. Engaging a new public partner can be time consuming and expensive, and a project pipeline allows prospective private parties more time to investigate opportunities and prepare proposals. Private partners typically start establishing consortia for a PPP procurement six months to a year in advance of the formal procurement launch.

Function 4: Involve All Relevant Departments of the Public Agency Early

Many State DOTs have an office, division, or department that takes the lead during the early PPP development process. However, in later stages of the lifecycle of a PPP project, other departments of the sponsoring agency will play an important role, such as the procurement offices and local district offices. It is critical that staff members in all relevant departments of a sponsoring agency be involved with the PPP project as early as possible to ensure project delivery that meets all Stated goals and is considered a successful practice.

3.2. Project Development

Project development for PPP focuses on selecting, evaluating, and structuring potential projects. This process should be guided by legislation and policy, such as long-term transportation planning objectives. Projects suitable for PPP are typically large and complex, providing opportunities for innovation in delivery. As with any major project, extensive analysis determines economic benefits and financial viability. Assuming the project passes these tests, analysis is conducted to compare the value of a PPP delivery with a conventional procurement.

After selecting a project to be delivered through a PPP, public agency staff refine technical and financial details such as scope, schedule, revenue streams, performance measures, etc. This effort typically involves conducting preliminary engineering and developing a procurement strategywhich includes bid evaluation

criteria and drafting the PPP contract. The optimal structure of a PPP depends on the characteristics of the project, the goals and capabilities of the public agency, and the quality and capabilities of potential private partners. Key elements considered in this phase include the allocation of responsibilities and risks; compensation mechanisms; concession terms; performance standards; and performance management processes.[4)]

3.2.1. Project Definition

The PPP project definition stage does not differ substantially from traditional project definition. The generated information includes high-level project concepts, sketch level cost estimates (capital and operating), and projected revenues (if applicable). This preliminary project information serves as the foundational data for key assumptions used for further evaluation.

A fundamental project definition step occurs as part of the National Environmental Policy Act (NEPA) process. During NEPA, a project's purpose and need are refined and a range of alternatives (including a no-build scenario) is developed. The NEPA process is critical to general project development and has clear implications for the eventual PPP configuration. The project alternative chosen through the NEPA process will have a major impact on costs and revenues. For instance, the project definition could result in the construction of additional bridges over wetlands, increasing project cost, or the removal of a toll road segment from the project, reducing operating revenues.

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4) USDOT Federal Highway Administration. *Key Considerations in Implementing a Public-Private Partnership (P3) Program*. 2014. http://www.fhwa.dot.gov/ipd/pdfs/fact_sheets/factsheet_key_considerations_impementing_p3s_072314.pdf (accessed on September 20, 2015). USDOT Federal Highway Administration. *Conducting Procurement for Public-Private Partnerships (P3s)*. 2013. https://www.fhwa.dot.gov/ipd/pdfs/p3/factsheet_06_conductingprocurement.pdf (accessed on September 20, 2015).

Stage 1: Select PPP Projects from Long-Range Transportation Plans

A long-range transportation planning effort helps States articulate a vision for the future by evaluating proposed projects in light of public goals. Projects consistent with the long-range plan have been analyzed for technical feasibility and transportation benefits. Ensuring that projects chosen for PPP delivery are consistent with long-range transportation plans helps PPP project success.

By Federal statute, each State's DOT prepares and maintains a long-range, 20-year plan encompassing a broad range of transportation improvements, i.e., highway, transit, passenger rail, and non-motorized. Based on this plan, the State's DOT also develops a shorter-term (4-6 years) Statewide Transportation Improvement Program (STIP) showing specific projects designed to further the goals of the long-range plan. The STIP must be fiscally constrained, and approved by the Federal Highway Administration (FHWA) and Federal Transit Administration.[5] Major metropolitan regions within each State develop similar long-range plans and regional Transportation Improvement Programs (TIPs) under the auspices of Metropolitan Planning Organizations (MPOs). Development of the STIP and TIPs includes input by local governments and their constituents. Projects that have undergone the vetting process for inclusion in a STIP or TIP have demonstrated their importance, are technically viable, and are fiscally constrained.

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5) "Fiscally constrained" means that the funding for the project is reasonably expected to be available, and if it is in the first two years of the Transportation Improvement Program (TIP) in a nonattainment or maintenance area, funding for the project is available or committed. A P3 project may be reasonable if there are clear expressions of support by appropriate local/regional decision makers and a strategy exists for securing necessary approvals. Other indicators of "reasonableness" include if a State or local jurisdiction has had past success in implementing P3s, the State has P3-enabling legislation in place, or efforts are underway to enact legislation. http://www.fhwa.dot.gov/planning/guidfinconstr_qa.cfm (accessed on September 20, 2015)

Stage 2: Inform the PPP Process with Data from NEPA Analysis and Inputs from the Public Involvement Process

The National Environmental Policy Act(NEPA) requires, to the fullest extent possible, that the policies, regulations, and laws of the Federal government be interpreted and administered in accordance with its environmental protection goals. NEPA requires the examination and avoidance of potential impacts to the social and natural environment when considering approval of proposed transportation projects. Conclusion of the NEPA process results in a decision that addresses multiple concerns and requirements. As a result, a new-build project is likely to undergo an extensive NEPA review.

Typically, the environmental process ends with the issuance of a decision report that explains the reasons for a project decision and summarizes any mitigation measures. Although a completed NEPA process provides assurance, it can also limit both the public and private appetite for innovative approaches that would entail revisiting the environmental review. For this reason, government agencies may choose to begin a PPP procurement process before the end of the NEPA process. In this situation, public agencies must be careful that the PPP procurement does not prejudice the environmental process, particularly by affecting the choice of alternatives. Additionally, initiating the PPP procurement process before the end of the NEPA process will likely lower private sector interest in the project, since by definition the project may not proceed as expected due to the possibility of a delayed or no-build option being selected through the environmental process.

3.2.2. Project Screening

Once a project has passed initial screening, the public agencies begin detailed evaluations to determine if the project is economically beneficial and financially viable. Then, public agencies conduct VfM analysis to answer the critical question of which delivery modelPPP or otheris best for the project. These evaluations help decision-makers choose the best project scope definition and the optimal structure of a potential PPP project.

① *Multi-Level Screening*

Public agencies need to be able to rule out unsuitable projects and focus on more attractive candidates. Multi-level screening can help public agencies quickly assess whether or not a PPP procurement is an appropriate delivery option.

Multi-level screening criteria can include a high-level, mostly qualitative, screening and a detailed, more quantitative, analysis. Typically, the high-level screening serves as a first hurdle, assessing a project's suitability for PPP delivery. High-level screening provides a way for State agencies to systematically evaluate if candidate projects have the necessary elements for successful PPP implementation. These elements may include: sufficient complexity to leverage private sector innovation, compliance with Federal requirements, possible accelerated project delivery, alignment with long-range transportation plans, potential for efficiencies through PPP delivery, and potential to generate revenue. Long-range transportation plans and NEPA reports typically provide the type of data needed to answer qualitative questions in a high-level screening.

Projects that passed high-level screening then move on to detailed screening. This secondary screening is used to determine if procurement via PPP offers additional efficiencies that cannot be achieved through traditional procurement such as the ability to transfer risk, or the ability to raise capital. Data needed to conduct a detailed screening include: sketch-level usage forecasts, risk assessments, and preliminary construction, operations, and maintenance cost estimates.

Example: Commonwealth of Virginia

The Commonwealth of Virginia's 2014 PPTA Implementation Manual and Guidelines serves as guidance to the VAP3 for the identification, screening, and prioritization of projects considered for PPP.[6] The screening process and criteria are as follows:

High-Level Screening

The criteria for high-level screening are similar for each projectalthough unique aspects are addressed on a case-by-case basisand answer the following questions:

Project Complexity: Does the complexity of the project warrant the additional use of private sector knowledge and expertise?

Accelerating Project Development: Does a PPP allow the project to be built under a faster time schedule than the traditional delivery method?

Transportation Priorities: Does the project meet transportation needs and is it consistent with the overall agency's objectives and priorities?

Efficiencies and Risk Transfer: Does risk transfer create efficiencies and can projects be bundled together, and are these risks

6)http://www.virginiadot.org/office_of_transportation_public-private_partnerships/resources/UPDATED_PPTA_Implementation_Manual_11-07-14_FOR_POSTING_TO_WEBSITE_-_changes_accepted.pdf

transferable to the private sector over the long-term?

Funding and Capital: Will revenue generation offset or partially offset public funding, does the project meet availability payment criteria, and would funding the project as a PPP allow for more free capital to be spent on other transportation projects?

Detailed-Level Screening

A detailed-level screening examines the feasibility of solicited and unsolicited projects that are candidates for PPTA procurements, ultimately resulting in a Detail-level Screening Report for each project to be delivered within 15 days of the review.43 Detail-level screening of selected, unsolicited proposals also occurs within 15 days.

Below is a brief summary of the two major categories within the detailed-level screening:

Desirability of the Project:

Does the project address needs in local and State transportation plans, and will it improve safety, capacity, and other positive externalities?

Does the project improve regional economic development and attract industries and businesses?

Is there a market demand for PPP procurement?

Is there sufficient stakeholder support within the community and are communication strategies in place, and will it meet approval within regional transportation plans?

Feasibility of the Project:

Does the project meet the required technical feasibility to be built? This includes everything from design standards and scheduling to right-of-way, permitting, and environmental standards.

How will land use be impacted and will the project interface well with existing facilities?

Is public funding required, and does the proposed financial plan

adequately address questions of financing?

Will new legislation be required?

Are there any unacceptable risks being shouldered by the agency and are there any major risks that are not being addressed that can impair the project?

Are the concession terms acceptable for this type of project to maximize value, and are the arrangements for performance management and hand back outlined?

② *VfM Analysis*

After a project passes through the multi-level screening analysis, additional information is necessary for evaluating project suitability for PPP delivery. Additional analysis can address economic feasibility, financial feasibility, and compare delivery options. Serious issues related to the financial feasibility of the project or drastic changes in project scope during the procurement phase could lead to significant delays and reduce market appetite. Conducting these analyses before the project proceeds to procurement has proved successful.

Typically, for large-scale projects, two types of analysis are conducted: a benefit cost analysis and a financial feasibility analysis. For PPP, an additional analysis can be conducted in which a conventional delivery method (typically called the Public Sector Comparator) and a PPP delivery alternative (typically called the Shadow Bid) are compared. This type of analysis is typically called a value for money, or VfM analysis. VfM analysis is typically led by the State's PPP unit and its specialized consultants. Inputs to all analyses, including the VfM, typically come from subject matter experts within the State DOT, such as engineers, cost estimators, etc. VfM analysis benefits from being conducted at

least twice: once prior to procurement to determine whether the project is suitable for PPP delivery, and again after the bids have been received to confirm the value received from PPP delivery. Table 1 below describes in detail the three types of analyses.

While the core of the VfM analysis is a quantitative comparison of delivery models, it does not capture all the differences relevant for decision-making. For example, specific considerations with respect to regulation, complexity, or organizational capacity often cannot be monetized. A successful practice is to not only to compare the cash flows of the Public Sector Comparator and the Shadow Bid, but also to assess any non-monetary impacts important for decision-making.

Table 1: Typical Analyses Completed for PPP Projects

Type of Analysis	Possible Tool	Technical Description	Key Question that the Analysis Answers
Economic Feasibility	Benefit-Cost Analysis	Net Present Value (NPV) calculation of all social and economic benefits and costs of the project	Is the project economically attractive from the perspective of society?
Financial Feasibility	Financial Viability Analysis	NPV calculation of all financial cash flows of the project	Is the project financially feasible? or Can the public agency afford the project?
Comparing Delivery options	VfM Analysis	Comparison of the NPV of (expected) PPP cash flows and expected conventional delivery method cash flows	What is the optimal delivery method? or At what point is the PPP bid more attractive than conventional project delivery?

③ *Assessing Public Liabilities*

PPPs are long-term contracts with long-term financial obligations for the government. These obligations fall into two broad categories:

- ▶ Direct financial obligations, such as availability payments or milestone payments, to the private concessionaire.

- ▶ Contingent liabilities, such as payment for compensation events, which reflect specific risk allocation between the public agency and the private concessionaire. In a compensation event, the public agency pays the concessionaire for a government action that adversely affects revenues.

The identification of contingent liabilities is a key element of the PPP contract, and the public agency's explicit acceptance of these liabilities is rarely quantified under conventional delivery. Therefore public agencies need to assess explicitly all retained public liabilities in PPP contracts to manage the public fiscal risks and reach successful outcomes in PPP projects.

A thorough understanding of public liabilities is essential to proper public management and can also prevent delays and confusion in later project phases. Sharing an assessment of public liabilities can also improve transparency and accountability. However, valuation can be difficult due to the long-term nature of PPP contracts, which are subject to known and unknown technological, financial, commercial, and political uncertainties.

Conventional public fiscal analysis methods may not address all

long-term liabilities in PPP. Agencies can develop tailored fiscal risk management and monitoring frameworks to fit their circumstances, helping them to assess risk both at the project level and the portfolio level. Key elements of this framework should include:

1. Rigorous identification of risks and uncertainties.

2. Reasonable valuation of risks and uncertainties.

3. Continuous monitoring and if applicable mitigation of risks and uncertainties.

3.2.3. Public and Industry Involvement

A successful PPP project requires public support and private sector interest. Public involvement and industry outreach during the project development phase can help State agencies determine which projects are desirable, defuse politically controversial issues, and lead to a smoother procurement process in later stages.

① Proactive Public Outreach Strategy

As expensive projects with concepts and arrangements that differ from traditional project delivery, PPP projects can be controversial and garner negative public attention. For successful PPP implementation, public outreach is important: it facilitates open communication and minimizes misconceptions among all parties. Public agencies that have been successful at implementing PPP are proactive in their outreach and continuously involve the public across many media, providing credible, accurate, and easy-to-understand information. Therefore, using a proactive outreach strategy to gain and maintain public support is an

important success factor for PPP.

PPP public outreach methods should not differ substantially from those used for conventional procurements. Concerns expressed by the public regarding a PPP project may be the same as for its conventionally delivered alternative, such as construction impacts and the use of tolling. However, additional attention should be paid to addressing issues specific to PPP such as early termination payments, non-compete clauses, toll rate setting (in toll concessions), and compensation events. Public outreach is an opportunity to clarify that many compensation events (such as those for undisclosed archaeological sites or endangered species) are identical to the protections that a public agency would provide under a standard construction contract, albeit under a different title.

Proactive public outreach strategie sscheduling regular public comment periods, allowing submission of written comments, including publicly available project data on an easy-to-use website, and announcing public meetings well in advanceare all beneficial to PPP projects. In addition, public outreach can be used as an additional opportunity to educate the public and explain the principal benefits of this project delivery approach. Additionally, a large volume of information is typically generated for PPP as part of the project screening process. By making preliminary documentation, such as multi-level project screening results, available to the public, the government agency increases public education and transparency.

Example: Extensive Electronic Media Outreach in 495 Express Lanes Project in Virginia

The 495 Express Lanes project consists of four High-Occupancy

Toll (HOT) lanes on the Capital Beltway between the Springfield Interchange and just north of the Dulles Toll Road, a distance of 14 miles each way. The $2 billion project is financed, constructed, and operated as a PPP under Virginia's Public-Private Transportation Act of 1995 through an 85-year concession (five years of construction and 80 years of operation) between VDOT and the concessionaire, Capital Beltway Express Lanes LLC. Construction began in the spring of 2008 and reached substantial completion on November 8, 2012. The facility opened to traffic on November 17, 2012.[7)]

VDOT and the concessionaire used extensive public outreach through digital media including email blasts, radio podcasts, websites, and cell-phone apps. Both the VDOT's and the project's websites included information on how the PPP is structured, how HOT lanes function, and how to pay. The websites contained the project's concession agreement, public presentations, public hearing announcements, minutes/notes from public hearing meetings, descriptions of environmental and safety issues, construction and maintenance notifications, etc.

During the construction, the concessionaire actively engaged with the public to address traffic disruptions and safety issues.

Construction of the 495 Express Lanes required the demolition and reconstruction of the Idylwood Bridge a two-lane bridge that served as a major artery for a large residential community. Closing the bridge and detouring traffic allowed crews to substantially accelerate the delivery of the new bridge, but would be inconvenient for local residents. The project team knew that closing the bridge would be met with significant community

7) FHWA Project Profile:
http://www.fhwa.dot.gov/ipd/project_profiles/va_capital_beltway.aspx

opposition, so the construction team chose to engage the community in the decision-making process. The project team hosted informal sessions with community leaders in local homes, sought input from local officials, hosted community-wide workshops and conducted a survey of residents. Eventually, local residents accepted the closing of the bridge willing to put up with an inconvenient detour in exchange for a shorter construction period. As a result, the concessionaire completed the new Idylwood Road Bridge nearly a year-and-a-half ahead of schedule and strengthened a strong cooperative partnership with the surrounding community and elected officials.

② Further Develop Projects with Industry Input

Industry feedback can help public agencies refine projects as they are developed for PPP delivery, allowing for a better understanding of private sector capabilities and interests. Public agencies that incorporate industry feedback can structure more commercially attractive projects, potentially increasing competition. However, it is important to have a well-defined project prior to reaching out to the industry. This requires having the necessary PPP legislation in place, internal consensus regarding the project scope, and sufficient financial resources, if needed, for the public contribution. In addition, political support should be secured prior to initiating industry outreach.

Developers want as much certainty in a project as possible. Industry outreach can inform developers about a project, instill confidence about the capability and commitment of the public sector, and test the market's appetite for the project. Industry outreach is also a way to inform local contractors about the PPP process and the nature of the transaction. This helps overcome local contractors' concerns about PPP and opens up the market

to new participants.

Public agencies can carry out industry outreach in many ways including:

- ▶ Issuing a Request for Information (RFI)
- ▶ Holding Industry forums
- ▶ Sending email or distributing website updates.

3.3. PPP Procurement and contract

A public agency will initiate a PPP procurement process after it has determined a project's suitability for PPP delivery through screening and analysis, and solicited feedback from the public and private industry. A PPP procurement differs from the traditional procurement of other large-scale projects because of the transfer of project risks and responsibilities to the private partner, such as securing the financing and operating and maintaining the project. The long-term nature of PPP projects also adds to their complexity. All of these factors result in the need for a competitive procurement environment that is transparent and protects the public interest, while addressing private bidders' needs for predictability, confidentiality, and fair competition. This can be achieved through PPP procurement processes that foster interaction between the public and private parties and transparent bid evaluations.

3.3.1. Competitive Environment

Creating quality competition during the procurement phase is vital. Public agencies benefit the most when multiple bidders submit quality proposals generating robust competition between the most capable private firms. This increases the likelihood that the winning bid will be the best choice for delivering a project that achieves public goals.

① Shortlist Qualified Bidders

Public agencies use an RFQ process to identify a select group of bidders based on predefined technical and financial qualifications. Respondents with little or no relevant experience are excluded from the RFP stage, increasing the overall quality of the final proposals received. Given the time and resources required for the public agency to conduct a multi-step procurement, it is important that the agency selectively identify bidders for advancement. The shortlisting of qualified bidders is considered standard practice for any complex procurement and is particularly important for PPP procurements.

From the bidders' perspective, since the cost of developing a detailed proposal during the RFP stage is significant, they too typically prefer to compete among a handful of shortlisted teams. A smaller pool of competitors increases the probability of succeeding at the RFP stage, which motivates bidders to invest resources in developing a high-quality bid. Normally a pool of 3-4 bidders is sufficient to ensure a competitive process. As such, the presence of an RFQ stagewhich is relatively inexpensiveattracts private sector companies to participate in what can be a lengthy process.

② Draft RFP with a Consultative Process to Reach the Final RFP

The goal of the PPP procurement process is to execute a contract that outlines how the project will be delivered. Similar to a traditional procurement process, public agencies issue an RFP to seek competitive proposals. The RFP reflects the public agency's vision for the PPP project. Since all PPP are partnerships that involve a long-term transfer of risks and responsibilities, the final PPP agreement should meet the needs of both partners. To that end, the public agency can use a draft RFP to solicit input from the pre-qualified bidders. This consultative process allows the public agency to incorporate selected feedback and refine the RFP. This process decreases the likelihood of major last-minute amendments to the final RFP, which could distort the competitive process and increase transaction costs. Therefore, public agencies benefit from using a draft RFP process to solicit feedback from bidders before issuing a final RFP.

Incorporating feedback from pre-qualified bidders on the draft RFP can help the public agency clarify its needs and objectives and ensure an optimal allocation of project risks and responsibilities. Comments on a draft RFP can range from requests for simple clarifications to fundamental changes. The public agency decides which comments, if any, to accept.

③ Allow for Alternative Technical Concepts

A successful PPP procurement encourages bidder creativity to increase the value from PPP delivery. Ideas that emerge can improve service quality and lower life-cycle costs. The use of an alternative technical concepts (ATCs) process enables and encourages bidders to provide such creative ideas.

ATCs are suggested changes to the technical specifications developed by the procuring agency. In general, contracting agencies require ATCs to maintain or improve project quality compared to the original specifications (often referred to as equal or better). If higher quality delivers higher value to the agency, ATCs should lead to higher scoring on the non-financial bid evaluation criteria. Formally, ATC proposals that reduce scope, quality, performance, or reliability are not considered. In practice however, the ATC process appears to allow technical concepts that reduce the quality, and that are submitted by bidders solely as a way to gain competitive advantage and lower their bid price. In such a case, a lower score on non-financial criteria would be appropriate, in order to ensure fair competition.

Public agencies typically incorporate ATCs as *individual* changes in the RFP. In other words, the public agency approves the ATC for an individual bidder, but keeps it confidential from others. Although this practice can lead to challenges in terms of bid comparability and procurement fairness, it gives bidders comfort with respect to confidentiality. Without such confidentiality, proponents lose incentive in invest in researching innovative and cost saving ATC ideas. Another approach for incorporating ATCs into the RFP is to allow for *generic* changes whereby the public agency changes the language of the baseline RFP specifications for all bidders. This mitigates fairness issues yet may lead to confidentiality challenges, which is why agencies using this procedure make sure changes in specifications do not disclose specific solutions. Because of the complexity of handling ATCs, certain agencies choose to wait until after the RFP process to adjust the specifications in order to accommodate accepted ATCs.

Example: Indiana Department of Transportation (INDOT) Successfully Implemented a Large Number of ATCs in the Ohio River Bridge East End Crossing Procurement Process

The East End Crossing project consists of a new bridge across the Ohio River, and associated roadway, tunnel, and facilities. The bridge connects Clark County, Indiana with Jefferson County, Kentucky, approximately eight miles east of Louisville. The State of Indiana is leading the project, and the Indiana Finance Authority (IFA) led the procurement. The project is being delivered as an availability payment DBFOM contract with a four-year construction period and a 35-year operation term.

ATCs were allowed during the procurement phase, and led to individual changes to the RFP that were incorporated after selection of the preferred bidder.

During the procurement, IFA guaranteed full confidentiality of ATC proposals. ATCs approved by IFA involved full transfer of the risks related to the implementation of those ATCs to the bidders, but the authority agreed to support the implementation of the ATCs to the extent possible. IFA followed a formalized process and format for accepting ATCs, resulting in a large number of alternative concepts, half of which were accepted.

④ *Pay a Stipend to Unsuccessful Bidders that Submit a Compliant Bid*

Developing PPP proposals will almost always be more expensive than developing proposals for traditional procurements. The cost to develop compliant bids can exceed $10 million per bidder for a large and complex PPP project. The bidders' willingness to invest

in high-quality bids depends on the expected return. As such, a public agency that reimburses unsuccessful bidders reduces bidding costs and thereby encourages high-quality proposals. Paying a stipend to reimburse at least a portion of the cost of unsuccessful, yet compliant, bids is therefore an effective way of fostering robust competition.

The typical stipend provided by a public agency does not fully cover the cost of an unsuccessful bid. It does, however increase the interest of the private sector because it demonstrates the agency's commitment to the procurement process. A partial reimbursement also ensures that bidders are committed to the process, and do not submit bids merely to earn the stipend. The amount of the stipend is typically fixed, but can vary due to the size and complexity of the project. The stipend is also a way for public agencies to compensate bidders for the intellectual property they are getting ownership of through the procurement process.

3.3.2. Bid Evaluation

Following issuance of the final RFP, proposal teams prepare and submit bids to the public agency. For most procurement evaluations, public agencies include pass/fail criteria that must be satisfied before any comparative factors are considered. If a bid receives a pass rating on each of the minimum requirements, it is then scored on other criteria such as: the dollar value of the offer, the least subsidy or availability payment required, the shortest proposed length of the concession term, or the least NPV of gross revenues required. The selection of the preferred partner can be based on the financial proposal in conjunction with qualitative factors, a combination often referred to as best value. In theory, it is possible to reflect all key public objectives in minimum, pass/fail, criteria. In practice, there are trade-offs

between price and other consideration that cannot be captured in minimum requirements. Beyond the minimum requirements, the challenge is making the evaluation sufficiently objective and transparent.

① Evaluate Based on Best Value

Because PPP are typically complex, long-term projects, the evaluation of proposals can be difficult. Bids should be evaluated on factors that represent public objectives, including cost, quality, required subsidy, design, etc. Evaluating bids solely on price fails to address the inherent complexities of large scale PPP projects. Best value procurements account for factors, such as quality and timing, other than price. Using best value criteria allows public agencies to pursue a range of objectives. Best value procurements also allow private bidders to differentiate themselves in ways other than price. Both public agencies and bidders benefit from using best value.

Providing clear parameters and scoring methods within the bid reports are important for achieving a positive result for both the public agency and the bidders. For the public agency, clear parameters and scoring methods provide strong guidance to bidderswhich could increase the likelihood that the accepted bid will meet project objectives and goals. For bidders, clear scoring methods that explain how non-monetary objectives will be incorporated provide insight into how their proposals will be received. In practice, this requires defining clearly the evaluation criteria and scoring system, including the consideration of ATCs (if allowed).

② Minimize Negotiations after Selection of the Preferred Bidder

Draft PPP contracts are typically introduced along with the RFP. Contract changes are typically negotiated with preferred bidders. A basic procurement principle holds that any negotiated change to the contract must not be material to the procurement. Material, in this case, means that another bidder could have been selected or could have submitted a different offer had the amended term been proposed in the original procurement reports. For example, substantive changes in risk allocation would likely go beyond what is followed under good procurement practice and permitted under most procurement laws. By not allowing for material changes after the selection of the preferred bidder, the public agency limits the possibilities for strategic bidding and maintains a level playing field among competitors. Typically, revisions to the draft PPP contract with the preferred bidder are limited to clarifications and confirmation of commitments. Therefore, it is desirable to finalize PPP contract terms as much as possible before the submission of bids to minimize post-selection negotiations with the preferred bidder. An exception is the case of States where ATCs are handled after the selection of the preferred bidder, in which case negotiations on how to incorporate the ATCs in the PPP Agreement are unavoidable.

Finalizing the commercial contract terms is often completed prior to finalizing financing arrangements. Neither party wants to renegotiate commercial terms due to financial negotiations between the preferred bidder and its lenders. Therefore, bidders are typically required to secure financing commitments to the reasonable extent possible. In the U.S. market, the frequent participation of two Federal financing programsPrivate Activity Bonds (PABs) and TIFIA loansleads to separate execution of project reports (the commercial closing) and financing reports (the

financial closing) for each PPP transaction. These programs, which can significantly reduce financing costs, make their initialconditionalcommitments to the project itself, allowing each competing bidder to factor the value of these programs, using common assumptions provided in the RFP, into its price proposal. For TIFIA, financial negotiations then occur between the USDOT and the preferred bidder. The interest rates for both PABs and TIFIA loans are fixed at financial close, which may occur several months after commercial close. This extends the interest rate risk for all bidders, who must in every case make assumptions on the interest rates and credit terms used to prepare their price proposals.

3.4. Monitoring and Oversight

After achieving commercial close and financial close, focus shifts to project implementation. For the public agency, work transitions from developing and procuring the project to managing its implementation and operation. The focus of the monitoring and oversight phase is to see that the project is delivered and complies with the performance standards in the PPP agreement. The monitoring and oversight phase extends to both construction and operation of the facility.

Monitoring and oversight of a PPP requires a strong set of contract management skills and a significant level of proactive management, with a clear division of responsibilities between the public agency and the private operator. Key contract management issues include monitoring technical and financial performance, assessing payments and penalties for performance, resolving disputes, and promoting an effective, long-term partnership. As

described in earlier chapters, the foundations for monitoring and oversight are laid during preparation and procurement, when the key reports are drafted and finalized.

The public agency's capacity to monitor technical performance during construction and operations is critical for success.[8] Responsibility typically belongs to a special contract management team within the agency. Specific arrangements and processes are needed to manage the contract, and these institutional arrangements should be in place before the contract commences. The personnel involved in monitoring and oversight should have detailed knowledge of the project and the contract terms.

In practice, post-construction monitoring can differ between user fee PPP and availability payment PPP. For a toll-based concession, it is assumed the private partner has an incentive to meet the performance standards, because the project revenues depend, in part, on performance. As a result, most toll-based concession agreements lack detailed performance monitoring systems or financial mechanisms to enforce performance standards. For availability payment PPP, such performance-based monitoring and incentive systems are needed to align public and private interests for the duration of the partnership, and are thus considered central to the PPP agreement. This obligation also incentivizes the private partner to deliver a high quality infrastructure project as they will also be held accountable for the asset's long-term performance and any maintenance required to meet performance standards.

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8) Federal Highway Administration. *Key Considerations in Implementing a Public-Private Partnership (P3) Program.* 2014. http://www.fhwa.dot.gov/ipd/pdfs/fact_sheets/factsheet_key_considerations_impementing_p3s_072314.pdf (accessed on August 18, 2014) and Federal Highway Administration. *Monitoring and Oversight for Public-Private Partnerships (P3s).* 2013. http://www.fhwa.dot.gov/ipd/pdfs/p3/factsheet_07_monitoringandoversight.pdf.

3.4.1. Performance Monitoring

From the public agency perspective, ensuring that the private partner meets its contracted level of performance requires three main components: criteria, a monitoring system, and financial incentives. All three should function together as a system. For availability payment concessions, this system is the core of the agreement, as it aligns the public and private interest in the project. For user fee concessions, the contractor is already motivated to meet the performance standards, as they directly influence overall usage and revenue. Most U.S. toll-based PPP therefore have neither a detailed monitoring system nor financial incentive mechanisms to enforce performance standards.

① Define Output-Based Performance Standard

Output-based performance specifications focus on what a facility is intended to achieve, rather than the methods and materials used to achieve those goals. Output-based performance specifications allow the private partner to develop solutions that reduce overall life-cycle costs while delivering the intended level of service. In practice, public agencies in the U.S. often apply a combination of prescriptive construction requirements and output-based post-construction service requirements. Construction requirements are not necessarily redundant because the private partner will be responsible for the long-term performance of the road. Environmental processes and requests from project stakeholders often lead to specific requirements that need to be addressed and often are not defined in output-based terms. In addition, the expected life of some project components will exceed the contract term, which means that the interests of the public agency are not sufficiently protected by the O&M requirements in the contract.

Project goals and functional requirements are established by the contracting agency. The development of Key Performance Indicators (KPIs) and output-based specifications can be challenging, particularly for agencies that are used to prescribing detailed requirementsor even designs. Nevertheless, these specifications are at the heart of the PPP contract: because they will determine service standards for the contract duration, sufficient time should be spent to develop them and their linkage to the payment mechanism and monitoring system.

A public agency may already have experience developing performance standards and collecting test data in its traditional procurements. Furthermore, public agencies may be able to glean some helpful practices from international experience developing and using output-based specifications in PPP projects. However, as the perception of quality of service can vary depending on the agency and community needs, KPIs and output-based specifications should not simply reflect generic standards, but should instead be tailored to address project-specific concerns.

Applying quality standards can differ between PPP and traditional procurementparticularly when O&M is performed by the public agency. Often, the level of maintenance that public agencies wish to perform will be constrained by limited budgets. PPP contracts however, commit the finances of the public agency and the performance of the private partner throughout the term of the contractleading to higher and/or more consistent quality.

Example: I-4 Ultimate Project Technical Requirements Represent FDOT's Successful Practice

The most recent FDOT's availability payment PPP, the I-4 Ultimate

Project reflects the agency's latest thinking in terms of requirements and specifications. The RFP requires that bids comply with both project-specific requirements and FDOT's Standard Specifications for Road and Bridge Construction.

The 500-page RFP Volume II on Technical Requirements starts with the project description including scope, objectives, and general standards and requirements (Sections 1 and 2) then continues with design and construction criteria (Section 3), O&M requirements (Section 4), and hand-back requirements (Section 5).

The O&M requirements are generally less prescriptive and more performance-based than the design and construction criteria. Section 4 includes a set of tables that address four categories of performance failures: 1) construction availability faults, 2) construction O&M violations, 3) availability faults, and 4) O&M violations. The tables also specify minimum performance requirements, fault classifications and cure periods, which links the performance requirements to the payment mechanism.

② Establish a System for Monitoring PPP Performance

Public agencies are heavily involved in monitoring the performance of contractors under conventional delivery methods, including DB. In a PPP, although some of the monitoring roles will be carried out by the public agency, the private concessionaire will primarily monitor its own performance and report periodically to the public agency. Nonetheless, the public agency can ensure that the private partner is performing as promised by independently verifying the reports. Therefore, establishing a system for monitoring PPP performance that includes a role for both the public agency and the private partner is a factor of success for

PPP.

Most PPP contracts obligate the private partner to implement quality assurance and quality control (QA/QC) procedures and a monitoring system, providing the agency with the results from both sources. Typically, the project lenders require similar protections. This arrangement allows the agency to transfer some monitoring costs to the private partner. However, the agency cannot solely rely on the private partner. It is in the public interest that the information it receives is reliable and correct; therefore, the concession agreement typically allows for audits on the monitoring system and actual service delivery. As both the public agency and the private partner have a financial interest in the outcome, the use of independent auditors and certifiers can prevent conflicts of interest. In addition, discovering potential quality or performance issues early through proactive monitoring allows more time to correct issues, rather than immediately be confronted with defaults and non-compliance events. In the early years of the concession it may be prudent for the agency to monitor and verify the private partner's data on a more regular basis. Once the agency becomes comfortable with the accuracy of the data, it may be able to scale back the frequency of reviews.

Example: Self-monitoring is used for the Port of Miami Tunnel, Florida

The Port of Miami Tunnel will connect the Port (located on an island in Biscayne Bay), via the MacArthur Causeway (State Road A1A - which connects Miami to Miami Beach) to I-395 on the mainland. The project includes a tunnel under the Main Channel, roadway work on both Dodge Island and Watson Island/MacArthur Causeway, and widening of the MacArthur Causeway Bridge. The project is structured as an availability payment PPP, and the

concessionaire is Miami Access Tunnel, LLC (MAT).

Under the PPP agreement, FDOT will provide MAT a total of $100 million in milestone payments during the construction period between 2010 and 2013 and a $350 million final acceptance payment upon the completion of construction. This will be followed by 30 years of availability payments during the operating period. The annual availability payment begins at $33 million (2009$), with adjustments for inflation. Payment deductions will be made if MAT's performance does not meet the standards set in the concession agreement.

FDOT applies a self-monitoring concept in this project, in which MAT is responsible for its own monitoring, and for notifying FDOT of noncompliance. During procurement, bidders were required to develop a Project Management Plan, Preliminary Quality Plan, and O&M Plan. The Preliminary Quality Plan had to meet a range of requirements, including QA/QC programs for design and construction as well as operations. The O&M Plan had to demonstrate effective self-monitoring processes and procedures to monitor compliance with minimum performance criteria and an effective method of tracking and reporting the following: noncompliance points, violations during construction, violations after completion, availability faults, and construction closures.

③ Provide Performance Incentives through a Payment Mechanism

Public agencies want to ensure that concessionaires perform their contractual duties. Payment mechanisms can provide incentives to comply with KPIs and output-based specifications, aligning the interests of the concessionaire, public agency and other stakeholders. Aligning performance incentives through a payment mechanism has proved successful in PPP.

Payment mechanisms generally include penalty points, which can lead to payment deductions or retentions. Agreements also typically have a mechanism for non-compliance or default points that, when they reach a specified level, can result in increased oversight, remedial work by the public agency at the concessionaire's expense, suspension or termination of the contract. Should the private partner underperform, the public agency's manager must enforce the obligations of the PPP contract.

The payment mechanism is typically developed in the project development phase and often refined, as a result of feedback from bidders, in the procurement phase. Determining the level of financial penalties can be a challenge: they must be large enough that the private partner makes decisions in the public interest. Often the tickle-hurt-kill principle is used when determining the appropriate level of penalties:

- If penalties are too low, the concessionaire may accept the penalty rather than pursue a remedy (tickle).
- Therefore, the key is to set penalties that matter and motivate the private partner to pursue a remedy (hurt).
- If penalties are too high, the concessionaire can be unreasonably punishedeven defaulting on the basis of minor breaches of the contract (kill).

Agencies may hesitate to apply the penalties in the PPP contract due to concern over harming their relationship with the concessionaire. Agencies need to strike a balance between being confident in fully following the terms of the concession contract

and developing good professional relationships with the PPP concessionaire.

Example: Use of Financial Incentive Mechanisms on the I-595 Corridor Roadway Improvements Project

The Florida I-595 Corridor Roadway Improvements project consists of the reconstruction and widening of the I-595 mainline and all associated improvements of frontage roads and ramps from the I-75/Sawgrass Expressway interchange to the I-595/I-95 interchange, a total project length of 10.5 miles. A major project component is the construction of three reversible express toll lanes to be known as 595 Express, serving traffic between the I-75/Sawgrass Expressway and east of SR 7, with a direct connection to the median of Florida's Turnpike. These lanes were designed to be operated as managed lanes with variable tolls to optimize traffic flow.

The first transportation availability payment PPP in the U.S, the project features a 35-year agreement between FDOT and a private concessionaire, I-595 Express, to design, build, finance, operate, and maintain the roadway. The concessionaire received no compensation from FDOT until the facility was fully operational. Upon FDOT's final acceptance of the project construction, I-595 Express started receiving a series of annual lump sum final acceptance payments, including potential bonuses for completing a series of interim milestones (related to major construction activities) within established contractual deadlines.

Performance-based availability payments are made monthly during the operating period. The contract defines a maximum annual availability payment of $65.9 million (in 2009 dollars) that escalates annually. If quality, performance, and/or availability

requirements are not met, the availability payments are subject to downward adjustment. The contract specifies two main categories of adjustments: 1) availability adjustments (for unavailability of sections of the road), and 2) O&M violation adjustments (for violation of contractual obligations with respect to O&M). The Payment Mechanism (Appendix 6 of the I-595 PPP Agreement[9]) includes the formulas that are used to calculate the adjustments and resulting monthly availability payments.

3.4.2. Long-Term Partnership

The PPP approach to project delivery is intended to provide high-quality, cost-effective, reliable, and timely service at an affordable price. The success of this approach is enabled by a good relationship between the public agency and the private entity. Partnering sessions and joint decision-making protocols help create and maintain these relationships, even when ownership of the private entity, or political leadership of the public agency, change.

① *Establish a Collaborative Working Relationship between the Public Agency and the Private Entity*

The success of a PPP project depends on a strong and collaborative working relationship between the public and private partners. Frequent and open communication is essential in building this relationship. Obviously, this requires a collaborative attitude among the people involved, which cannot be formally enforced. However, certain approachesincluding the use of "partnering sessions," working committees, and a clear dispute resolution processcan stimulate such collaboration and contribute to the long-term success of the PPP.

9) All I-595 Express documents can be found at: http://595express.info/documents.shtm

Partnering sessions bring all relevant members of the public agency and concessionaire together to help establish a vision of partnership for the PPP project. The first session is typically held immediately after contract close, and can be most helpful in creating both formal and informal lines of communication. Subsequent sessions can be held periodically to strengthen those lines of communication and reinforce collaboration. The agendas of the partnering sessions vary among projects. Typically, a first partnering session includes an introduction to the entire public and private teamsand the roles of all the team members. Both partners explicitly describe their ambitions for the project and their vision for the partnership. Some aspects of these sessions may seem rather symbolica pledge to the project's key operating principles, for example, or to transparent communication between the public and the private partnerbut are meaningful to the participants. Such aspects create awareness of formal rights and obligations while they help build informal relationships as well. There is no standard formula for subsequent partnering sessions, which are likely to address specific challenges and issues relevant at that particular time.

In addition to partnering sessions, structured public–private committees active during all project stages can stimulate open communication. Examples include a works committee during construction, a transition committee between construction and the operational phase, and an oversight committee during the operations. Typically, partner representation is broader and meeting frequency is higher during construction than after.

Example: 495 Express Lanes Project Used Partnering Sessions at Multiple Levels

For the 495 Express Lanes project in Virginia, partnering sessions

were held on a regular basis during the construction phase using the same facilitator throughout. There were three levels of partnering:

(1) Team Partnering Sessions were held annually to discuss challenges, accomplishments, and allow project executives to personally deliver the key messages to the team. About 150 team members attended these sessions.

(2) Principals Partnering Sessions were held with senior managers and executives about quarterly. Key issues and challenges were discussed and prioritized, with subsequent action plans and champions put in place. These had about 20 participants.

(3) Executive Partnering Sessions were held with project managers (senior to senior managers) and executives about quarterly. Critical items, overall performance, and paths to success were discussed, with most issues being either resolved or a given a clear path forward. The Executive partnering sessions initially had about 12-15 participants. In the last year of the construction phase, the Principals and Executive partnering sessions were combined.

A Level 4 Escalation team was also put into place, comprised of key executives from each partner, with responsibility to reach agreement on scope of work differences, disputed changes, and critical decisions to move the project forward without claims or delays by any parties.

4. Challenges of PPP and Federal Role

Interest in using PPP approaches to develop and finance transportation improvements has increased in recent years due to the convergence of a number of key issues. They include growing travel demand, rising capital costs, constrained funding, aging infrastructure, and increased pressure on shrinking budgets. These trends reinforce the need for innovative solutions to meet transportation investment needs. Alternative delivery strategies are attractive to public agencies, particularly when resistance to new or increased taxes persists. PPP provides project sponsors with a number of potential benefits, including access to new sources of financing, reduced capital and life cycle costs, and the potential to accelerate the completion of needed projects.

4.1. Benefits and Challenges of PPP

4.1.1. Potential Benefits of PPP

Although financial capacity is often what initially motivates consideration of PPP concessions, the incentives created by concessions can also lead to greater overall value for the public sector through improved asset management and on-time and on-budget delivery.

The most important potential benefits of using PPP to deliver transportation projects include:

- ▶ Risk sharing protecting project sponsors from the cost and consequences of negative events

- Accelerated project delivery compared to traditional DOT project scheduling and delivery methods;

- Introduction of project construction and life-cycle cost efficiencies, and improved quality and system performance from the use of innovative materials and management techniques that may result in higher initial quality to minimize long-term maintenance and operations costs;

- Ability to apply special incentives and disincentives to improve project performance and operating efficiencies;

- A more optimal distribution of risks, that is allocating certain project risks to the private-sector (e.g., financing, schedule, long-term operations, and maintenance) and retaining others with the public agency (e.g., program management, environmental clearance, permitting, and right-of-way acquisition);

- Substitution of private resources and personnel for constrained public resources; and

- Access to new sources of private capital, while leveraging scarce public resources and conserving public sector debt capacity.

4.1.2. Implementation Challenges

PPP are complex arrangements and require careful deliberation before agreements are executed. While PPP strategies can provide significant benefits as described above, they are not appropriate for all transportation projects. Some of the potential challenges in

implementing PPP include:

- Difficult financial, legal, and technical issues that require oversight over the length of the contract period. States need to acquire the technical and institutional capacity to develop and oversee PPP and will need to hire outside expertise to help in various phases, including planning, project feasibility evaluation, contract negotiations and performance monitoring.

- State enabling legislation is needed to undertake a PPP. To date, 35 States, the District of Columbia and Puerto Rico have enacted statutes that grant agencies statutory permission to enter into PPP agreements.

- Although PPP can offer access to capital, they do not provide States with new revenue; in fact, PPP need a reliable revenue stream to work.

- Private financing entails higher financing costs compared to tax-exempt public financing. However, private financing (debt and equity) may be necessary in order to conserve limited public debt capacity. In some cases, these higher costs can be mitigated though the use of Federal tax provisions (e.g., accelerated depreciation), more flexible financing terms, and innovative finance tools, such as PABs and TIFIA, to reduce the cost of borrowing for private debt.

- There are several uncertainties (e.g., traffic and revenue projections; pricing and allocation of risk; private sector returns) that need to be included in feasibility assessments for PPP projects. Understanding these factors is essential to ensure an objective analysis and a proper balance between

responsibilities, risks and rewards of the parties involved in the transaction.

▶ Finally, transparency and education in the PPP process are key to achieve public support. In the past, there have been many misperceptions about PPP due to inadequate public information and openness in the process. For example, a common misperception is that the public sector □loses□ control or ownership of the asset by transferring a significant amount of control of, and risk for, one or more elements of a project to a private partner for a specified period of time. In reality, the public partner does not relinquish ownership of the facility and remains involved to the extent that the contract terms clearly define the responsibilities of public and private parties, and other provisions protect the public interest (e.g., toll setting, frequency of toll rate adjustments, service standards).

4.1.3. Public Policy Issues

PPP projects have been less prevalent in the U.S. than in many other countries in part due to historic public policies that have led to large Federal investments via grants-in-aid for highways discouraging the construction of toll roads. Federal regulations that prohibit tolling of the Federal-aid highway system and constraints on Federal tax exemption for financing and long-term leases have the potential to limit the use of PPP. Similarly, State policies on tolling and private financing of public infrastructure may also limit public agencies in use of PPP. Crafting and attaining approval of policies that allow equal consideration of tolling as a method to help pay for transportation projects can help facilitate fair consideration of PPP strategies.

When contemplating the possible use of PPP procurements policymakers should consider a number of strategic issues:

1) Whether to set up a PPP program or develop PPP projects on a project-by-project basis;

2) Establishing criteria and a process for the selection of projects for evaluation as a potential PPP;

3) How to structure a commercially valuable PPP agreement that achieves policy goals, optimally allocates project risks, and brings value to the investment;

4) How to conduct a fair and competitive procurement to select the best partner and negotiate a final agreement that is transparent and protects the public interest while addressing the private partner□s concerns.

4.2. The Federal Role and Financial Support

4.2.1. Federal Involvement

Since the creation of the Federal Aid Highway Program (FAHP) with its predictable flow of funding, State departments of transportation (DOTs) have relied on a combination of State and Federal revenue sources to fund highway construction. During the period which ultimately led to significant increases in funding to support the InterState and a growing set of companion programs, revenue mechanisms such as tolling and bonding were debated intensely. The “pay as you go” model was considered the “gold

standard," intended to promote accountability and fiscal integrity among grantees. This meant that public investments decisions essentially did not take into account the time value of money and the cost of deferred investment to communities and the Nation until complete funding for a project was effectively in hand. Using Federal aid grants on a "pay as you go" basis requires grantees to accumulate sufficient Federal and State sources to fund project construction and development. While that is taking place, however, project costs can increase due to inflation thereby eroding the buying power of funds already accumulated.

As States and agencies grew more sophisticated and aware of the cost of such delays, they began to consider diverting from strict "pay as you go." Along with using new mechanisms to borrow from future revenue sources, including a greater use of toll revenue, they began to partner with the private sector in the delivery of projects via various PPP models to optimize their portfolios. Traditional Federal funding continues to play a role and continues to evolve with respect to the blend of traditional formula programs, features that address tolling, and programs that provide technical and loan guarantee support. Various Federal policy initiatives have been advanced to facilitate and encourage private sector participation in infrastructure delivery. Starting with the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA), and with each major transportation program authorization since, USDOT and FHWA have introduced financial and programmatic innovations that have been incorporated as part of the financial and project development and delivery approaches for various projects. The following sections provide an overview of some of Federal tools and programs contributing to the successful financing and delivery of many of today's groundbreaking PPP projects.

4.2.2. Federal Aid Highway Grant Program

Longstanding Federal Financial support has been provided as a collection of categorical grants, mostly to State DOTs, known as the Federal Aid Highway Program (FAHP). Administered by FHWA, typically FAHP grant funds are distributed through apportionment formulas to the States from receipts in the Highway Trust Fund. Distributions are made on a reimbursement basis as States incur qualifying expenditures to develop and construct highway projects and then request reimbursements from the FHWA.

The funding details of the individual programs have changed over time but generally FAHP grants reimburse a Federal share of qualifying expenditures and thus result in a non-Federal expenditure or match. Within the FAHP there are numerous rules and regulatory requirements associated with using Federal funding for any given project expenditure, governing for example, funding percentages, eligible purposes, contracting procedures, and planning. For State DOT fund managers, compliance with Federal funding rules as well as managing State fund sources carrying their own set of rules, at times created significant cash management challenges and inefficiencies. As an example, at the end of a State fiscal year, State DOTs commonly managed their Federal Fiscal Year closure by assuring that their State funds were used as match to avoid the loss of soon to expire potential Federal program balances. One might argue that this could distort State priorities and optimal financial management.

4.2.3. Federal Initiatives and Tools

In order to provide the State DOTs greater flexibility in addressing these and other types of funding challenges, FHWA and USDOT

coordinated with Congressional leadership to focus on creating options to remove unintended barriers and transform the Federal role with respect to transportation finance. Though the standard Federal grant plus non-Federal match still remains as part of the funding plan even for complex projects delivered under the PPP model, there have been a host of initiatives and tools developed that serve to augment, leverage, optimize and accelerate the use of available Federal aid funds.

A series of administrative initiatives and legislative acts beginning in the early nineties laid the foundation for Federal tools and processes that provided increased flexibility to State agencies and encouraged private sector participation in the funding and delivery of highway projects. As noted earlier, ISTEA initially authorized new concepts designed to increase transportation investment. Outlined below are some of the key initiatives that have contributed directly or indirectly to the funding packages for the PPP projects covered in this report.

① TIFIA[10)]

Among the factors often cited for the relatively slow acceptance of the PPP delivery model in the U.S. has been the lower cost capital available to State DOTs via the tax-exempt bond market. In comparison and as evidenced by the high cost of borrowing for one of the early privately developed toll road projects, the Dulles Greenway, private borrowing was nearly cost prohibitive. As such, efforts to attract an increased level of private participation and investment in transportation infrastructure in the U.S were unlikely to succeed without private sector access to lower cost financing.

In 1998 Congress passed the TEA-21 authorization bill creating

10) Transportation Infrastructure Finance and Innovation Act

the Transportation Infrastructure Finance and Innovation Act of 1998 (TIFIA). Through the TIFIA Federal credit program, public and private sponsors could obtain direct loans, loan guarantees, and standby lines of credit for surface transportation projects in amounts up to one-third of the eligible costs. The TIFIA credit program was created to provide access to much needed capital for critical transportation projects facing challenges accessing debt through the regular capital markets. TIFIA credit assistance also provides loans at attractively low interest rates tied to U.S. Treasury bonds. TIFIA loan rates are typically lower than those available in the open market.

Credit assistance through the TIFIA program has provided a major boost to the development of the transportation PPP market in the U.S. The program is widely supported by members of the PPP industry who actively lobby Congress for the continuation of and increased financial support for the program. Approximately two-thirds of the PPP projects included in this report received credit support from TIFIA. In fact, during the height of the financial markets crisis, the only PPP projects to achieve financial close, did so with TIFIA credit assistance as a component of the plan of finance.

② *PABs*[11)]

Beyond creation of the TIFIA credit program, the Federal government has advanced legislation to provide private developers additional access to lower cost capital through the tax-exempt bond market. As noted earlier, State DOTs and other government entities have benefitted from provisions in the Internal Revenue Code (the Code) permitting municipalities to borrow funds in the capital bond market on a tax-exempt basis to finance public

11) Private Activity Bonds

works projects.

Generally, the private sector is precluded from borrowing funds in the tax-exempt market. However, there are certain qualified exceptions listed in the Code for which private entities may borrow funds in the tax-exempt capital market to finance projects that serve a public purpose such as hospitals and housing through the sale of Private Activity Bonds (PABs). It was not until 2005 however, with the passage of the Safe Accountable, Flexible, Efficient, Transportation Equity Act: A Legacy for Users (SAFETEA-LU) that the Code was amended to add highways and freight transfer facilities to the list of privately developed and operated projects for which PABs may be issued.

SAFETEA-LU limited the total amount of PABs for highway purposes to $15 billion. Typically issuance of non-highway, qualifying facility PABs is managed according to individual State volume caps. For highway projects, the $15 billion authorization is not subject to any State's PAB volume cap, but instead is allocated to qualifying projects by the Secretary of Transportation. About half of the PPP projects reviewed in this Report on PPP (and nearly all since its introduction) have included PABs as part of the financial package, often in combination with TIFIA assistance. The first such project was the I-495 Capital Beltway HOT Lanes project in 2007.

4.2.4. FHWA Activities Supporting PPP Concessions

Oversight and administration of the programs, tools, and initiatives highlighted above have been carried out by the FHWA[12] and the Build America Bureau. FHWA provides research, training and technical assistance for States interested in exploring and

12) Federal Highway Administration

implementing innovative finance and alternative PPP delivery options for highway projects. FHWA currently provides support to the USDOT's Build America Bureau.

The Build America Bureau and FHWA have been instrumental in streamlining the process for States and private developers seeking to navigate the available finance tools and initiatives and varied application and approval processes. Collaboration with the Build America Bureau and FHWA has been vital to sorting through a host of complex issues in developing PPP projects—particularly from a funding and financing perspective. When Caltrans was formulating the financial plan for the Presidio Parkway, it wanted to pursue use of FAHP grant funds as a revenue source for availability payments. However, the finance plan for the project also included TIFIA, which must be repaid from non-Federal sources. Further complicating matters was the difficulty in determining the portion of the long-term availability payment that could qualify for FAHP funds. FHWA coordinated efforts to evaluate Federal regulatory and policy issues and worked with Caltrans to sort through the funding issues to develop a solution that became the first FAHP-funded availability payment transaction.

Further, FHWA has developed tools and primers designed to increase public-sector understanding of the complexities of the PPP delivery approach and support better informed decision-making when contemplating whether a PPP option may be appropriate for a particular project. A suite of educational materials, referred to as the PPP Toolkit is available on the FHWA website.

5. Comprehensive Analysis of PPP in the U.S.

This Report on PPP Concessions provides a baseline tracking the evolution of the PPP sector in the United States in the 25 years since the award of the nation's first PPP—the Teodoro Moscoso Bridge in San Juan, Puerto Rico. This chapter of the report analyzes the 28 PPP concessions that have reached financial close since 1992, identifying trends in the types of projects developed on a PPP basis, the structure of their procurements, and the tools used to finance them. Table 2, 3 and 4 identify each of the 28 PPP concession projects, identifying their procurement structures and how they were financed.

In addition to tapping into new sources of financing and accelerating the implementation of needed transportation improvements, one of the key motivators for project sponsors to procure projects on a PPP basis is the ability to transfer risk to their private sector partners. These risks include capital construction cost overruns, construction completion schedules, toll revenue levels, and long-term maintenance cost overruns.

As described earlier, two distinct PPP structures have been used in the U.S. over the past 25 years—each of which transfers different risks to the private partner. The nation's earliest PPP transactions involved financings that leveraged toll revenues. Known as "real toll" transactions, these deals involved the significant risk that actual project revenues would fall short of forecasted levels, leaving the private partner unable to repay its debt. In 2009, a new approach was introduced where PPP projects are financed by leveraging a combination of milestone payments for meeting construction deadlines and annual availability payments paid by the project sponsor to the private

partner based on its ability to operate the project at a defined level of condition and performance. These so called “availability payment” PPP transactions carry considerably less risk, making them an attractive alternative to real toll PPP projects. While the Report on PPP Concessions includes collective analysis of all 28 PPP projects, given the distinctly different risk profiles of real toll and availability payment concessions, these two groups of projects are assessed separately.

In addition to the construction of new highway facilities, real toll concessions have been used on long-term lease transactions for existing toll facilities (i.e., “asset monetizations”). With these arrangements, private investor/operators are given the right to operate and collect tolls on an existing toll facility for a specified time period in exchange for making an upfront lease payment. The private partner may also be responsible for undertaking capital repairs or for expanding the facilities. The fact that these projects have proven revenue streams that date back decades in some cases mitigates traffic risk to a certain point. However, revenue levels generated by asset monetization concessions are also subject to fluctuations in the economy and are not without risk. The Report on PPP Concessions also contains separate analyses of real toll lease transactions.

5.1 Characteristics and Trends of PPP in the U. S.

The nation’s first three PPP projects—the Teodoro Moscoso Bridge in San Juan, Puerto Rico, the Dulles Greenway in Northern Virginia, and the 91 Express Lanes in Orange County, California—all reached financial close in the 1992-1993 timeframe. This initial period of PPP activity was followed by a ten-year hiatus without a

new PPP project. PPP activity picked up momentum in 2003 with the close of the South Bay Expressway in San Diego, California. With the exception of 2004, additional PPP projects have closed in all subsequent years. Since 2012, the United States PPP sector has seen between two and four highway projects reach financial close per year. The flow of new PPP deals may be slowing somewhat recently. This trend may be attributed through December 2015 to the lack of a national transportation authorization providing a steady and predictable flow of Federal monies to support investment in new transportation infrastructure. At the same time, the financial markets are taking a harder look at toll revenue risk. In addition, the number of States able to advance availability payment concessions is limited to those with high credit ratings. Nonetheless, there are new PPP projects on the horizon, and while the flow of new PPP transactions may be slowing, there will be continued PPP activity in the coming years.

In order to develop a better understanding of PPP trends over the past 25 years, it is helpful to assess outcomes separately for the three different PPP models described earlier.

5.2. Analysis on Real Toll Concession Projects

As shown in Table 2, fourteen, or exactly half of the PPP concessions to have reached financial close in the U.S. since 1992, are real toll projects. Eleven of these facilities have opened to traffic and the remaining three are in construction. The concession periods for these project range from 35 to 85 years, and average nearly 52 years. Of the eleven open real toll PPP facilities, two have since been purchased by public sector transportation authorities, and a third filed for bankruptcy in 2016.

<Table 2: Real Toll Concession>

Project	Theodoro Moscoso Bridge	Dulles Greenway	91 Express Lanes	Elizabeth River Tunnel	South Bay Expressway	I-495 Capital Beltway HOT Lanes	SH 130 (Segments 5-6)
Year	1992	1993	1993	2012	2003	2007	2008
Location	San Juan, Puerto Rico	Loudoun County, Virginia	Orange County California	Norfolk, Virginia	San Diego, California	Northern Virginia	Austin Metropolitan Area, Texas
Facility Type	Toll Bridge	TollRoad	Express Lanes Crossings	Tolled	Toll Road	Express Lanes Toll Road	Toll Road
Length	1.4 miles	14 miles	10 miles	<1mile	9.2 miles	14 miles	40 miles
Cost*(millions)*	$127	$355	$119	$2,088	$658	$2,069	$1,336
PPP Basics							
Type of PPP	DBOM	DBFOM	DBFOM	DBFOM	DBFOM	DBFOM	DBFOM
Concession Length	35 years	41 years	35 years	58 years	35 years	85 years	50 years
Financial Close	1992	1993	1993	2012	5/22/2003	12/20/2007	3/7/2008
Status	Open February 1994	Open September 1995	Open December 1995	Open November 2016	Open November 2007	Open November 2012	Open October 2012
Funding & Financing							
TIFIA				●	●	●	●
PAB				●		●	
Commercial Debt		●	●		●		●
Public Sector Payment				●		●	
Private Equity		●	●	●	●	●	●
Special Facility Revenue Bonds	●						
Donated Right-of-Way					●		
Interest				●		●	●
Milestone Construction Payments							
Tolls				●			
Bond Premium							
Other	●						
Source of Revenue							
Tolls	●	●	●	●	●	●	●
Availability Payments							
Concession Milestones	Refinanced 2003 Concession Extended 17 years 2010	Refinanced 1999 Concession Extended 20 years 2001 Sold to Macquarie 2005	Purchased by OCTA 2003		Bankruptcy filed 2010 Debt refinanced 2011 Purchased by SANDAG 2011	Debt refinanced 2014	Debt payment postponed 2014 Bankruptcy filed 2016 Concession transferred to creditors

<Table 2: Real Toll Concession (Continued)>

Project	North Tarrant Expressway (I820 and SH)	LBJ Express	I-95 HOV/HOT Lanes	North Tarrant Expressway 35W Project	US 36 Express Lanes (Phase 2)	I-77 Express Lanes	SH 288 Toll Lanes
Year	2009	2010	2012	2013	2014	2014	2016
Location	Fort Worth, Texas	Metropolitan Dallas, Texas	Northern Virginia	Fort Worth, Texas	Metropolitan Denver, Colorado	Metropolitan Charlotte, North Carolina	Houston, Texas
Facility Type	Expresslanes	Expresslanes	Expresslanes	Expresslanes	Expresslanes	Expresslanes	Expresslanes
Length	13 miles	13miles	29.4 miles	10.2 miles	15miles	26miles	10.3 miles
Cost*(millions)*	$2,122	$2,645	$923	$1,641	$209	$636	$1,064
PPP Basics							
Type of PPP	DBFOM	DBFOM	DBFOM	DBFOM	DBFOM	DBFOM	DBFOM
Concession Length	52 years	52 years	76 years	52 years	50years	50 years	52 years
Financial Close	12/17/2009	6/22/2010	11/20/2012	9/19/2013	2/26/2014	6/26/2014	5/9/2016
Status	Open October 2014	Open September 2015	Open December 2014	Construction	Open January2016	Construction	Construction
Funding & Financing							
TIFIA	●	●	●	●	●	●	●
PAB	●	●	●	●	●	●	●
Commercial Debt					●		
Public Sector Payment	●	●	●	●	●	●	●
Private Equity	●	●	●	●	●	●	●
Special Facility Revenue Bonds							
Donated Right-of-Way							
Interest			●	●		●	
Milestone Construction Payments							
Tolls		●			●		
Bond Premium						●	
Other					●		
Source of Revenue							
Tolls	●	●	●	●	●	●	●
Availability Payments							
Concession Milestones							

The concession period of one project was extended by 20 years in order for it to avoid bankruptcy, another was extended to help recoup losses earlier in the concession period, and two others were refinanced, one in the face of lower than anticipated toll proceeds. The remaining five operational real toll PPP projects opened to revenue traffic during 2014–2016, and initial financial results from these projects appear to be exceeding expectations in most cases.

As described in Chapter 2 of this report, real toll concession projects can be further broken down into three distinct groups:

- ▶ Greenfield toll road facilities
- ▶ Crossing projects
- ▶ Priced managed lanes

It is helpful to assess these project types separately in order to come to a better understanding of the outcomes of real toll PPP concessions.

5.2.1 Experience on Greenfield Toll Road

Greenfield toll projects are new toll roads in previously undeveloped highway corridors. These projects have significant revenue risk because there is no documented travel demand in the corridors. In many cases, revenue risk is exacerbated if traffic and revenue projections are predicated on growth in population and employment along the corridor. There have been only three

greenfield real toll projects built in the U.S.:

- ▶ Dulles Greenway in Northern Virginia
- ▶ South Bay Expressway in San Diego, California
- ▶ SH 130 (Segments 5-6) near Austin, Texas

The collective experience with the first greenfield toll roads in the U.S. has been mixed. The agencies sponsoring these projects and the public at large have benefitted from them. The projects have been built on budget without public sector funding and they provide new travel options to the public. However, for the private sector developers that financed, built and operate these three greenfield toll roads, their business results have been inconsistent, in large part due to larger economic conditions that influenced traffic and revenue levels. The initial developers of the Dulles Greenway were able to stave off bankruptcy by having their concession period extended by twenty years and restructuring their underlying debt. The growth in population levels and economic activity that the project's traffic and revenue forecasts were predicated upon were slow in coming, but did eventually occur. Nearly 10 years after opening, the initial investors were able to sell the concession, recover their costs and derive a profit. The new operators had the benefit of being able to price their offer based on 10 years of traffic and revenue data and, with the help of healthy toll increases, continue to operate the concession profitably.

The South Bay Expressway opened in late 2007 on the cusp of the impending financial crisis. The revenue forecasts prepared for the project assumed that it would be a catalyst for new development on the southern edge of San Diego. This growth was

slow in developing and weak revenues and lingering legal action forced the private concessionaire into bankruptcy. When the concession was sold to the San Diego Association of Governments (SANDAG), the proceeds from the sale were used to repay the project's commercial debt and the private partner lost $130 million of its own money that it had invested as at-risk equity in the project. SANDAG benefitted from the sale by buying a project that had been built at a cost of $658 million for only $341.5 million. This, in turn, enabled them to lower toll rates on the South Bay Expressway, benefitting the driving public in greater San Diego.

SH 130 has suffered from toll revenues that were 60 percent below forecasts upon opening. In spite of increases to the speed limit on SH 130 and 400 signs on I-35 encouraging motorists to use SH 130, many drivers prefer to use the more congested I-35 corridor because there are no tolls. While the concession company has transferred the roadway to its creditors and lost the $210 million it invested in the project, this has no impact on the State of Texas or the customers that use SH 130 Segments 5-6.

Based on the tenuous outcomes for the private partners who developed the first three greenfield highway PPP concessions in the U.S., private sector developers appear to have little to no appetite for participating in other greenfield highway concessions unless their public sector project sponsors fund a significant portion of their cost.

5.2.2 Experience on Real Toll Crossing

There have only been two real toll crossing projects in the U.S.:

- ▶ Teodoro Moscoso Bridge in San Juan, Puerto Rico

▶ Elizabeth River Tunnels (Downtown Tunnel/Midtown Tunnel/Martin Luther King (MLK) Expressway Extension) in Portsmouth and Norfolk, Virginia

With just two projects in this cohort of real toll PPP projects, it is difficult to draw conclusions on trends for crossing projects. The Teodoro Moscoso Bridge was the first PPP project to open in the U.S. and is financially stable. The bridge was completed in a timely fashion and with its relatively low construction costs and higher toll rates it earns a good return for the private partner and provides opportunities for profit sharing with the sponsor. Even so, the concession period was extended by 17 years in 2010 to help the concession company recoup losses experienced earlier in the term. The Teodoro Moscoso Bridge project is unique in that the Puerto Rico Highways & Transportation Authority (PRHTA) used its own bonding capacity to raise the necessary funding for the project and then passed the repayment obligation on to the private partner.

The Elizabeth River Tunnels project opened in stages in 2016, with only the rehabilitation of the existing Midtown Tunnel remaining to complete in 2018. The project illustrates the public acceptance risks associated with tolling□especially the introduction of tolls on existing facilities that were not tolled. In this case, the opposition included a lawsuit and anti-PPP legislation introduced by State legislators. The Commonwealth Transportation Board helped to mitigate the project's significant public acceptance risk by providing an additional $100 million in public funding in order to delay the implementation of tolling on the existing Elizabeth River tunnel crossing.

With a cost of nearly $2.1 billion, the Elizabeth River Tunnels project also provides evidence of the severe challenges of

financing a project of this scale without a meaningful public sector subsidy. In this case, public sector funding has attracted a much larger investment of at-risk private sector capital and credit. Traffic risk in the case of the Elizabeth River Tunnels is mitigated to some extent by the fact that historic traffic levels are well documented in each of the crossing corridors. Although the project involves the construction of a new tunnel, it adds needed capacity in a heavily traveled existing corridor. In this way, the risk levels associated with the Elizabeth River Tunnels project are similar to those of a brownfield project.

5.2.3 Experience on Real Toll Priced Managed Lane

With the exception of the Elizabeth River Tunnels project, all real toll PPP concessions that have reached financial close since 2009 have involved priced managed lane projects. There have been a total of nine priced managed lane real toll concessions implemented in the U.S. beginning with the 91 Express Lanes that entered into service in December 1995. Although there is a relatively large number of these projects, their collective outcome remains to be determined, as five of these projects are in construction or design at the time of 2015, and an additional three have been open for less than two years.

The following real toll priced managed lane projects are in operation in the U.S.:

- ▶ 91Express Lanes in Orange County, California
- ▶ I-495 Capital Beltway HOT Lanes in Northern Virginia
- ▶ North Tarrant Express (I-820 and SH 121/183) in Fort Worth, Texas

▶ LBJ Express in Dallas, Texas

▶ I-95 HOV/HOT Lanes in Northern Virginia (95 Express Lanes)

The first real toll PPP managed lane concession is the 91 Express Lanes, which opened to service in late 1995. Running in a geographically constrained valley in an extremely congested highway corridor, the project has been highly profitable for its entire history. It was built without any public money but was purchased by the Orange County Transportation Authority in 2003 in order to annul a non-compete clause in the PPP concession agreement that prevented Caltrans from making improvements to the parallel general-purpose lanes. Built at a cost of $119 million, the private developer sold the concession for $207.5 million and derived a significant profit.

Most of the more recent real toll PPP managed lane projects have involved much larger and more expensive improvements in heavily traveled commuter corridors with well-documented traffic levels. Nonetheless, the introduction of tolling for the first time introduces revenue risk. The public sector agencies sponsoring these projects have made significant financial contributions towards their construction in order to make their financings viable. In addition to managed lane capacity, these projects have also involved the reconstruction and enhancement of existing urban-suburban highway corridors and have featured concession terms in excess of 50 years.

The $2,068 billion, 85-year Capital Beltway HOT lane concession opened to service in late 2012 to lower than expected revenue levels. This led to a refinancing less than two years later, with the private partner investing an additional $280 million of its own

equity to reduce its debt servicing costs. While the outcome of this project is not certain, the concessionaire's additional equity investment indicates that it has confidence in the project's long-term financial performance.

The $2.047 billion North Tarrant Express (I-820 and SH 121/183) opened to traffic in October 2014 to revenues that were higher than industry expectations[13]. The project has maintained its credit rating, due to its positive performance and expectations for continued economic and population growth in the Dallas-Fort Worth metropolitan area. However, if the growth in traffic levels slows project reserves could erode.

The $923 million 95 Express Lanes project opened in Northern Virginia in December 2014. This is the only recent real toll managed lane project not to receive a public sector subsidy, due to its lower cost and healthy revenue generation potential. In its first six weeks of operation, revenues averaged $105,000 per day, which was higher than industry expectations[14].

The $2.615 billion LBJ Express opened to service in September 2015. Through the third quarter of its first full year of operation, although toll transactions were one percent below expectations, revenues were seven percent higher than budget due to higher-than-anticipated toll rates[15].

The $209 million U.S. Express Lanes (Phase 2) opened in January 2016. The Phase 2 private partner is also operating and collecting

13) Business Wire, February 27, 2015 http://www.businesswire.com/news/home/20150227005958/en/Fitch-Affirms-North-Tarrant-Express-Mobility-Partners

14) Fitch Ratings, March 30, 2015 https://www.fitchratings.com/site/fitch-home/pressrelease?id=982134

15) LBJ Express Quarterly Operations and Maintenance Report, Q3 2016 http://emma.msrb.org/ES988641-ES773865-ES1175182.pdf

toll proceeds from the U.S. 36 Express Lanes (Phase I) and I-25 Express Lanes, both of which have been built by the State of Colorado. Gross revenues on the combined Phase 1 and 2 U.S. 36 facility are slightly above expectation in 2016[16].

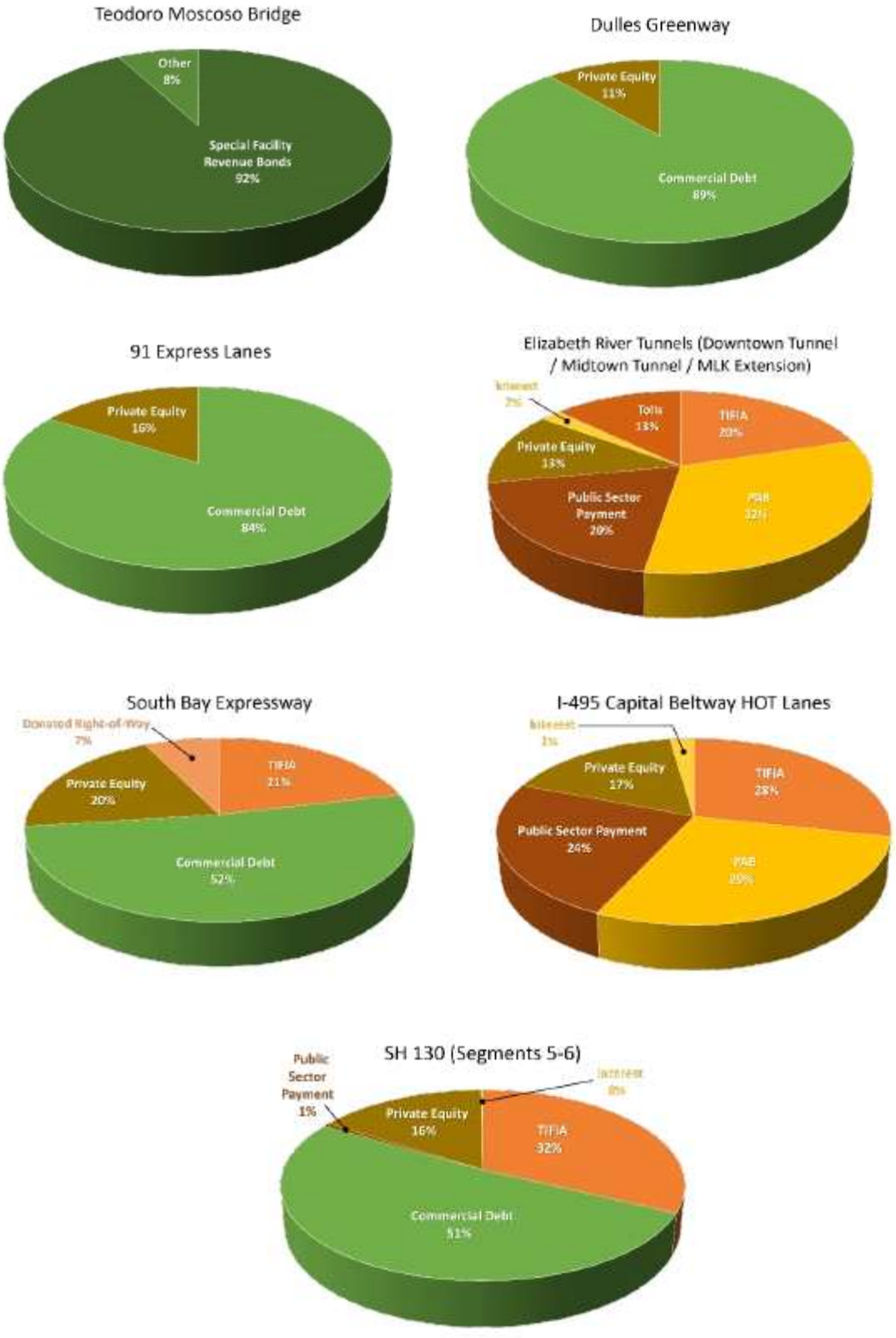
The remaining three real toll managed lane concessions are under construction or design at the end of 2016:

- ▶ North Tarrant Express 35W Project *($1.64 billion)*
- ▶ I-77 *($636 million)*
- ▶ SH 288 *($1.06 billion)*

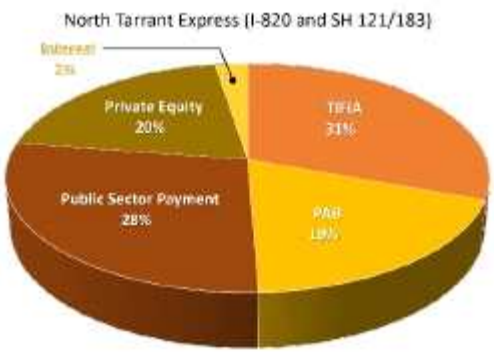
While these projects range in size, each transaction has included a subsidy from the public sector sponsor. In addition, the public sponsor of the North Tarrant Express 35W Project project is developing an extension of that project at its own cost. The private partner will operate the extension and be entitled to the toll revenues it generates. While the outcome of these three concessions is not known at this time, these important financial commitments demonstrate that project sponsors recognize that it would not be possible to implement these projects as at-risk, real toll managed lane concessions without public funding and other contributions in kind.

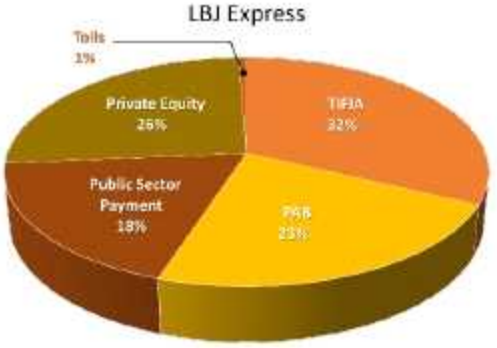
16) Fitch Ratings, December 2, 2016
http://www.businesswire.com/news/home/20161202005743/en/Fitch-Affirms-Plenary-Roads-Denver-LLCs-PABs

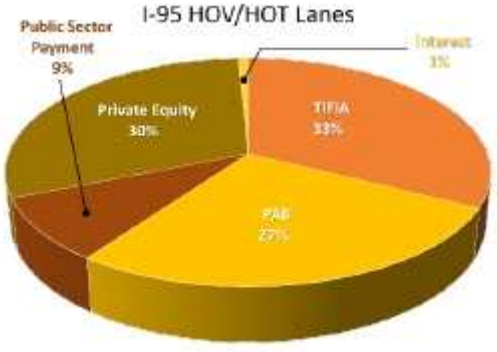
<Figure 2: Real Toll PPP Sources of Funding >

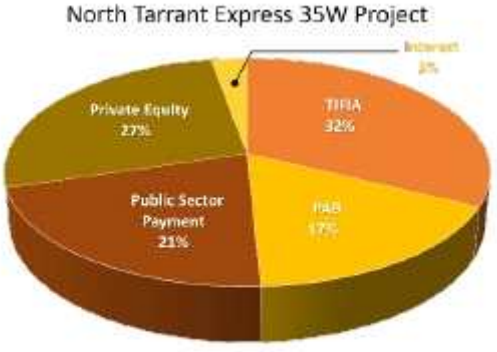


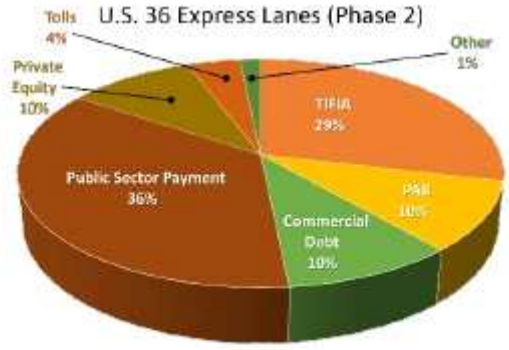
<Figure 2: Real Toll PPP Sources of Funding (Continued)>

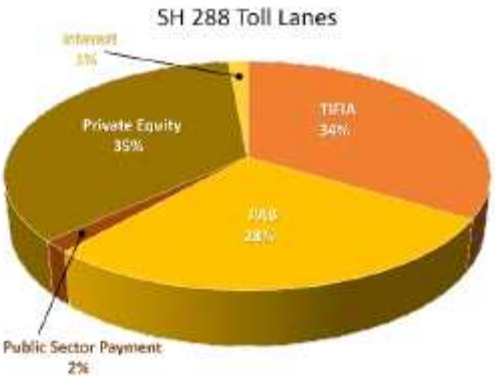












5.2.4 Financing Real Toll Concession Projects

Figure 2 provides pie charts identifying the funding and financing sources that have been used on the 14 real toll PPP concessions that have reached financial close in the U.S., together with the percentage of the total project cost they have provided. Each of the 14 real toll projects are presented chronologically. The three real toll projects built in the 1990s predate the establishment of today's Federal credit assistance. As a result, PPP developers had limited financing options. For example, the Dulles Greenway and 91 Express Lanes were both originally financed using a combination of commercial loans made by banks and at-risk equity provided by their sector development private partners. The Teodoro Moscoso project involved a one-of-a-kind financing where the government of Puerto Rico used its full faith and credit to raise special facility revenue bonds, which were then repaid by the private partner.

The TIFIA Credit Program was established by TEA-21 in 1998 to provide revenue-generating transportation projects with access to low-cost and flexible financing compared to the terms generally offered by commercial lenders. The goal of the program is to attract private and other non-Federal co-investment in transportation projects of regional and national significance. The program was created in recognition of the fact that State and local governments that sought to finance transportation projects with tolls often had difficulty obtaining financing at reasonable rates due to the uncertainties associated with tolling.

As shown in Figure 2, TIFIA loans have been used on all 11 real toll PPP transactions to have reached financial close in the United States since the program was established. Beginning with the South Bay Expressway in 2003, the TIFIA program has providing

approximately one-third of funding needed to support these projects. The TIFIA credit program was especially helpful to those projects that reached financial close in the wake of the 2008 financial crisis. The most recent real toll PPP project to benefit from the TIFIA Program is the $1.063 billion SH 288 Toll Lanes, which closed on a $357 million TIFIA loan on April 28, 2016.

SAFETEA-LU of 2005 amended Section 142 of the Internal Revenue Code to allow tax-exempt private activity bonds to be used to finance highway and freight transfer facilities. This change allowed private developers lower their borrowing costs by tapping the municipal credit market and gaining access to tax exempt financing. The I-495 Capital Beltway HOT lanes project was the first project to use PAB financing when it reached financial close in 2007. With the exception of SH 130 Segments 5 and 6, PABs have been used on all real toll PPP concessions to reach financial close since the establishment of the program. The combination of PABs and TIFIA financing has enabled real toll projects to proceed in a time of financial turmoil. It has also provided the necessary foundation to leverage other sources of financing, including at-risk equity contributions from private sector PPP investors.

The other major potential credit source for real toll projects is commercial debt. However, banks tend to lend money at a higher cost compared to Federal credit programs, as commercial lenders set interest rates to reflect the level of risk involved with each transaction. The risk level is generally documented by ratings assigned to these transactions by the three major bond rating houses: Fitch Ratings, Moody's, and Standard and Poors. Commercial debt has only been used on two real toll projects since the establishment of the TIFIA Credit Program: SH 130 Segments 5 and 6 and U.S. 36 Express Lanes (Phase 2). As

discussed earlier, the SH 130 project declared bankruptcy in March 2016, due to lower than expected toll revenues. Commercial debt was a viable financing tool for the U.S. 36 project because it leveraged the toll proceeds from two existing managed lane project, both of which had established and well documented revenue streams. This fact reduced the project revenue risk, allowing the banks to lend money at a more attractive interest rate. The project□s risk profile was further reduced because nearly half of its cost was covered by a combination of a public subsidy and private equity.

Public sector payments have also been an important funding source for several real toll projects. Increasingly, public sector sponsors recognize that large real toll PPP transactions will not be financially viable without their financial participation. Public subsidies can also play an integral role in the adjudication award of real toll concessions. In some procurements, bidders have been asked to specify the amount of the public subsidy that they would need to be able to complete a deal, and in others they are asked to identify the physical extent of a construction program they would be able to deliver with a fixed subsidy. Public subsidies are often used for larger and more expensive projects, such as managed lane improvements that reconstruct entire highway corridors or complex undertakings such as the Elizabeth River Tunnels.

Other sources of funding for real toll projects can include tolls from other existing facilities that the private partner has been asked to operate as part of a concession. Interest payments earned on the proceeds from loans before they are expended or on project reserves can also provide modest amounts of funding for real toll projects.

5.3 Analysis on Availability Payment Concession Projects

As shown in Table 3, a total of nine availability payment PPP concessions have reached financial close in the U.S. The availability payment approach was pioneered in the State of Florida in the mid-2000s with the Port of Miami Tunnel. Due to the complexity and high level of risk associated with the tunnel, the Florida Department of Transportation (FDOT) was keen on procuring the project on a PPP basis. However, it would not be politically feasible to toll the crossing. As a result, FDOT made the decision to use its own funding to make annual payments to a private partner that would design, build, finance, operate and maintain the project and have the private partner raise the necessary financing by leveraging the State's availability payments.

The availability payment DBFOM PPP approach has proven popular with private sector developers as it involves considerably less financial risk compared to real toll concessions. As State financial commitments, availability payment financings essentially leverage the faith and credit of State governments. However, there is the added risk associated with State legislatures obligating monies to DOTs in future budget cycles, and the risk involved with funding the availability payments in State DOT budgets. In addition to non-toll projects, public sector sponsors have also used the availability payment approach to procure toll projects that do not generate adequate amounts of revenue to cover their costs, or in cases where the sponsor wants to retain control of toll rates. Project sponsors use traditional Federal and State sources to fund availability payments. These can be supplemented with toll proceeds from projects procured on an availability payment basis, or other State and local transportation funding sources.

<Table 3: Availability Payment Concession>

Project	I-595 Corridor Roadway Improvements	Port of Miami Tunnel	Presido Parkway	Goethais Bridge Replacement	I-69 Section 5
Year	2009	2009	2012	2013	2014
Location	Broward County, Florida	Miami, Florida	San Francisco, California	Staten Island, New York	Bloomington, Indiana
Facility Type	ExpressLanes	Non-tolled Tunnel	Nont-olled Highway	Toll Bridge	Toll Road
Length	10.5 miles	1 mile	1.6 miles	1.3 miles	21 miles
Cost*(millions)*	$1,834	$1,113	$365	$1,526	$466
PPP Basics					
Type of PPP	Availability	Availability	Availability	Availability	Availability
Concession Length	35 years	35 years	30 years	40 years	35 years
Financial Close	3/3/2009	10/15/2009	6/14/2012	11/8/2013	7/23/2014
Status	Open *March 2014*	Open *August 2014*	Open *July 2015*	Construction	Construction
Funding & Financing					
TIFIA	●	●	●	●	
PAB				●	●
CommercialDebt	●	●	●		
Public Sector Payment	●	●		●	
Private Equity	●	●	●	●	●
Special Facility Revenue Bonds					
Donated Right-of-Way					
Interest	●	●	●		
Milestone Construction Payments		●		●	●
Tolls					
BondPremium					
Other					
Source of Revenue					
Tolls					
Availability Payments	●	●	●	●	●
Concession Milestones					

<Table 3: Availability Payment Concession (Continued)>

Project	I-4 Ultimate	Pennsylvania Rapid Bridge Replacement Project	Southern Ohio Veterans Memorial Highway	Ohio River Bridge- East End Crossing
Year	2014	2015	2015	2015
Location	Orlando, Florida	Pennsylvania Statewide	Portsmouth, Ohio	Southern Indiana, Louisville,Kentucky
Facility Type	Expresslanes	Untolled Bridges	Nont-olled Highway	Toll Bridge
Length	21 miles	NA	16 miles	3.8 miles
Cost*(millions)*	$2,878	$1,117	$647	$1,319
PPP Basics				
Type of PPP	Availability	Availability	Availability	Availability
Concession Length	40 years	25 years	35 years	35years
Financial Close	9/14/2014	3/8/2015	3/31/2015	4/15/2015
Status	Construction	Construction	Construction	Open December 2016
Funding & Financing				
TIFIA	●		●	●
PAB		●	●	●
CommercialDebt	●			
Public Sector Payment			●	●
Private Equity	●	●	●	●
Special Facility Revenue Bonds				
Donated Right-of-Way				
Interest	●	●		
Milestone Construction Payments	●	●		●
Tolls				
BondPremium			●	
Other				
Source of Revenue				
Tolls	●			
Availability Payments		●	●	●
Concession Milestones				

Five of the nine availability payment PPP projects in the U.S. remain under construction at the end of 2016. The remaining four have been open to service for less than three years. The following sections provide brief histories of these projects followed by a synthesis of the collective experience to date in the U.S. with availability payment concessions.

5.3.1 Experience on Availability Payment Concession

Although the first availability payment PPP projects did not reach financial close until 2009, half of the PPP projects that to have closed since then have been availability payment projects. Concession periods for availability payment projects range between 25 and 40 years, with an average of roughly 35 years. This is nearly 20 years less than typical concession periods for real toll PPP projects and provides an indication of the timeframe public sponsors are willing to extend payment obligations. Over half of U.S. availability payment activity has been concentrated in two States: Florida with three availability payment projects, and Indiana with two. The pace at which availability projects have been developed gained momentum in 2014 and 2015, with five projects reaching financial close in those two years alone. However, deal flow slowed in 2016, and it appears that there may be fewer availability projects in coming years[17].

Transportation agencies have used availability payment procurements to develop a wide array of highway projects. Five of the nine availability payment projects that have reached financial close involve non-tolled projects. They include a tunnel providing truck and vehicular access to the Port of Miami, the approach road to the Golden Gate Bridge, an InterState highway segment in

17) "Where Did P3 Deal Flow Go?" *Public Works Financing*, September 2015, pp 11–15.

Indiana, a highway bypass in Ohio and 558 one- and two-span bridges in largely rural regions around the State of Pennsylvania. The remaining four projects involve two priced managed lane projects in Florida and two toll bridges, one connecting New York and New Jersey and the other Kentucky and Indiana.

The expanding use of availability payment PPP procurements has been driven by a number of factors. They have proven an effective strategy to accelerate the completion of large and expensive projects that would otherwise be built in smaller pieces extended over multiple budget cycles. As with real toll projects, they also transfer lifecycle risk to the private partner and incentivize long-term maintenance efficiencies and cost savings. They also engender rigorous competition among the companies bidding for availability payment concessions, given that award decisions are based primarily on cost. They can also be an effective vehicle for providing sponsoring agencies access to international firms with expertise not necessarily available domestically—such as experience with subaqueous, wide-diameter, bored tunnel construction in the case of the Port of Miami Tunnel. One of the strongest motivations for project sponsors to use the availability payment approach is to extend all the benefits described above to high-priority projects that do not generate revenue, and would otherwise be procured using other means.

Although these arguments are all valid, many of the same outcomes can be achieved through design-build contracts. Public sector owners should also be aware of the potential downside to availability payment concessions. While some sponsors may initially have equated availability payments with lease, or off-balance-sheet transactions, all three major rating agencies consider them equivalent to debt obligations[18]. As such, the use

18) Jodi Hecht, "Are Availability Payment Obligations Debt?" *Public Works Financing*, September 2015, pp.

of availability payment concessions puts downward pressure on State credit ratings. This pressure can be mitigated to a certain extent if availability payment concessions are used on projects that generate toll revenues covering all or a portion of the State's obligations. However, this is not the case with availability payment procurements for non-revenue generating projects. Therefore, there is a limit on the volume of availability payment activity in order for States to avoid a threat to their credit rating. Because of this dynamic, the use of availability payment procurements is also generally limited to those States with stronger credit ratings.

The growth in the use of availability payment concessions in the U.S. has also clearly coincided with the wake of the 2008 financial crisis. With the tightening commercial credit market and the loss of the bond insurance market, availability payment concessions provided public agencies with a new way to structure PPP transactions that mitigate risks that some private investors may have no longer found acceptable, such as the revenue risks associated with real toll projects. The availability payment approach allowed project sponsors and private partners alike to focus on managing risks associated with construction, operations, and asset management. With the lower risk profile, the public sector may receive more competitive bids providing lower financing and capital costs.

Availability payment concessions are not without financial risk to the private sector. The private partner typically must assume appropriation risk associated with the availability payments themselves. However, State policies often mitigate this to an extent by prioritizing availability payments in their capital or work programs ahead of other agency obligations. Even with such policies, the annual State legislative appropriation process may still

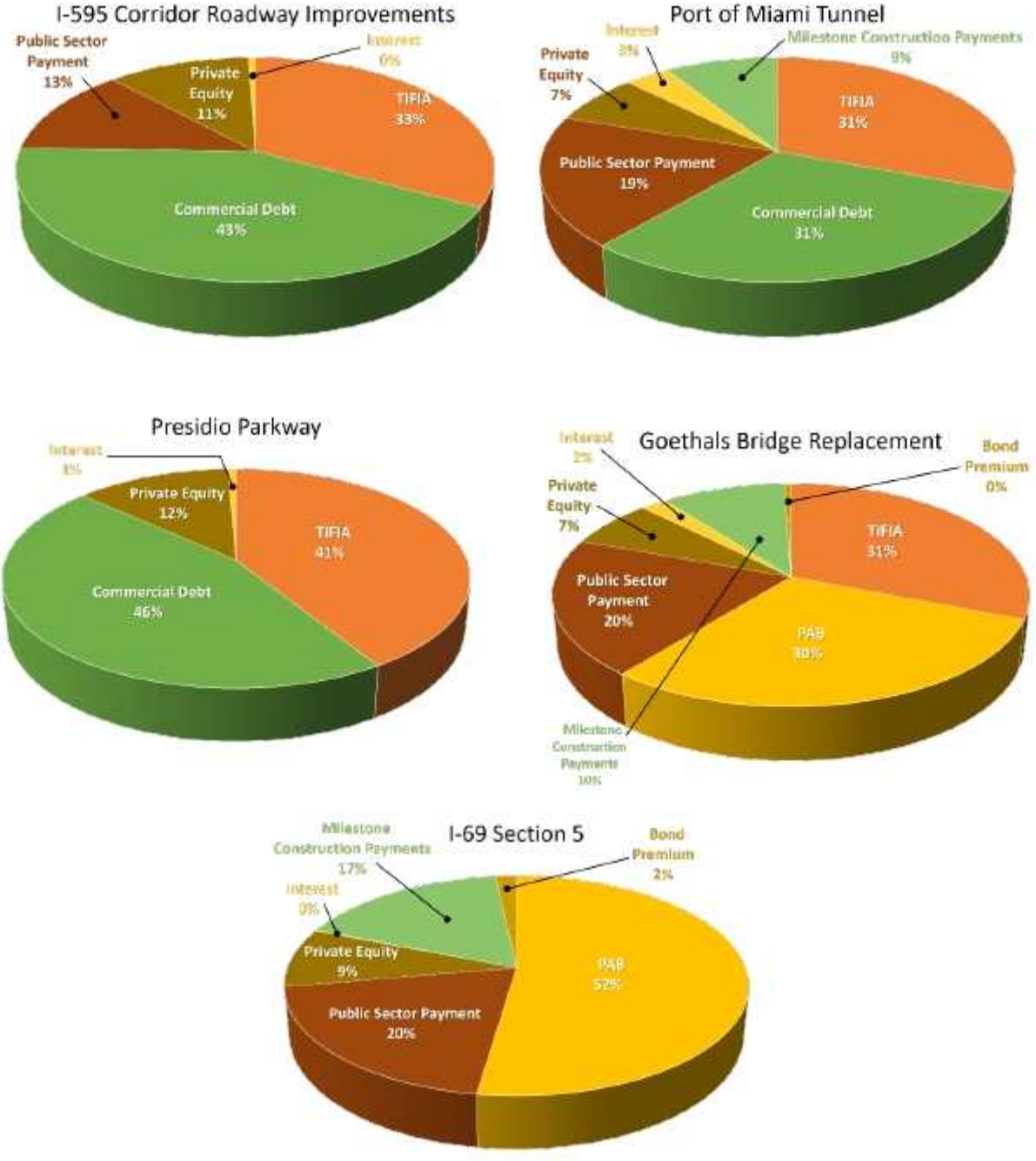
16-18.

present risk to the private partner. In the case of the Presidio Parkway in California, the State legislature chose to commit to a "continuous appropriation" that provides protection against budget delays, because, as a lump-sum appropriation, the funds may be paid regardless of passage of the annual budget.

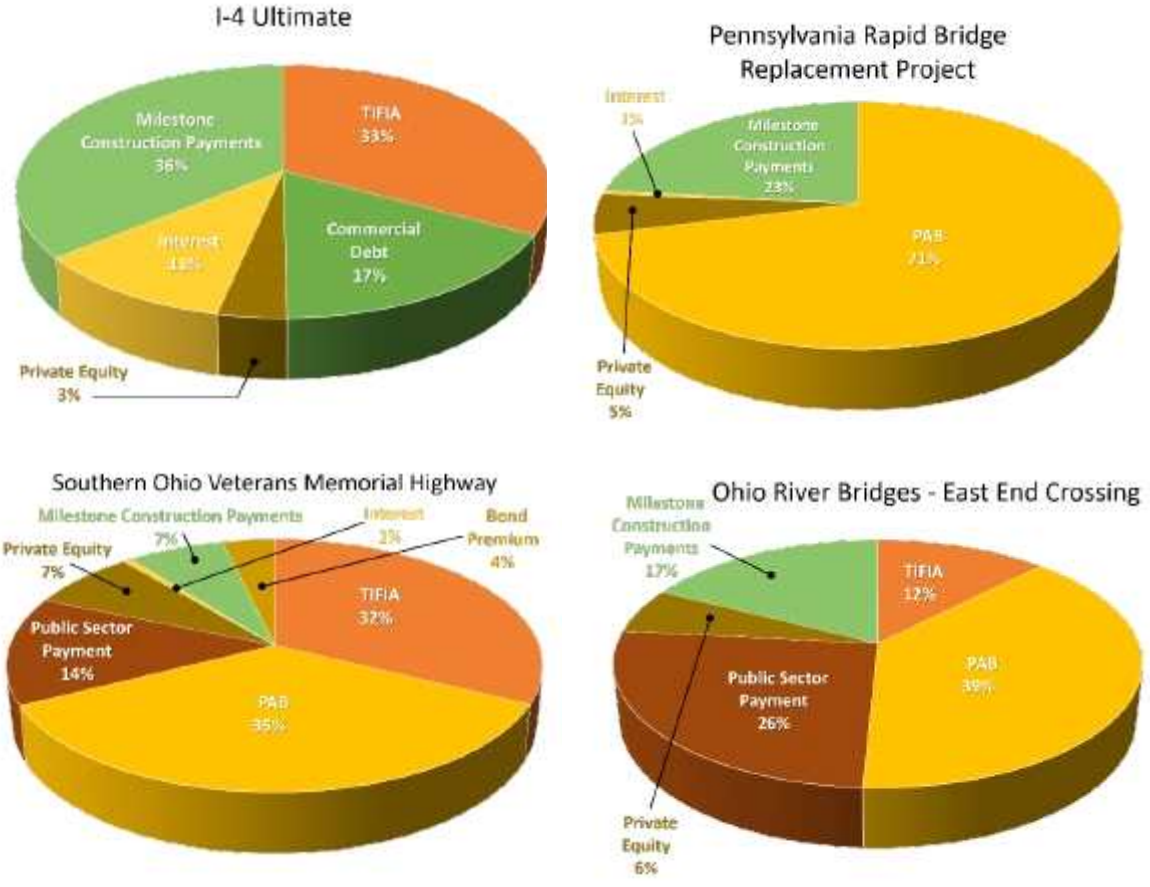
While availability payment procurements may afford many benefits to project sponsors, the fact that availability payments are prioritized above other needs reduces the sponsor's flexibility to allocate future revenues where they may be most needed. Public agencies should have a clear understanding of the impact availability payment obligations will have on their budgets and the State's credit rating, and they should only use this approach on high priority projects where it will deliver value. Florida has set caps on the overall amount of availability payment activity that can occur in the State. Its current portfolio of availability payment projects is well below the cap, enabling it to maintain the robust confidence of the credit agencies and derive the benefits from the procurement strategy on a small number of complex, high-priority projects.

Availability payment procurements are attractive to private sector developers because they mitigate the troublesome revenue risks associated with real toll projects. However, their upside profit potential is capped by the availability payments, which are fixed for the duration of the concession. Real toll concessions provide the potential for greater profit, but with much higher risks.

<Figure 3: Availability Payment PPP Sources of Funding>



<Figure 3: Availability Payment P3 Sources of Funding (continued)>



5.3.2 Financing Availability Payment Concession Projects

Figure 3 identifies the funding and financing sources that have been used on the nine availability payment PPP concessions that have reached financial close in the U.S. These projects closed between 2009 and 2015 and had access to all current Federal credit programs. Seven of the nine PPP concessions have used TIFIA loans. While TIFIA support is common among availability payment concessions, it is used with slightly less frequency compared to real toll PPP transactions. Both projects that did not use TIFIA loans did have PABs. An additional three projects used both PABs and TIFIA.

Four of the nine availability payment PPP projects have included commercial debt in their financings. This is a higher frequency compared with real toll projects and is likely related to the reduced financial risk profiles associated with availability projects. All four projects using commercial debt also involved TIFIA transactions. To date, no availability payment projects have paired commercial debt with PABs.

As with real toll PPP transactions, all availability payment financings have included private sector equity. However, compared with the 14 real toll projects, the average level of equity is significantly lower with availability payment projects: 9 vs. 22 percent. This higher gearing—the debt to equity ratio—is possible because availability payment projects are less risky. As a result, lenders do not require private partners to contribute as much equity in order to make loans supporting availability payment projects.

With eight out of the nine availability payment projects, their public

sector sponsors have made upfront payments to their private partners, either in the form of an upfont public contribution, milestone construction payments, or a combination of the two. Given that these projects are funded entirely with public money, this is a deliberate choice on the part of their public sponsors. By doing so, they reduce the amount of the annual availability payments they will pay throughout the life of the concession. It is interesting to note that availability payment concession financings tend to include a greater share of public sector funds compared with real toll concessions: 20 vs. 12 percent on average. This trend also reflects the fact that agencies sponsoring availability payment projects assemble their funding from a variety of sources, some of which may be limited for use on capital construction and others restricted to support maintenance needs.

As with real toll projects, availability payment financings can also include modest amounts in interest payments and bond premiums.

5.4 Analysis on Long-Term Lease Concession Projects

A total of five long-term lease concessions have reached financial close in the U.S. beginning with the Chicago Skyway, in 2005. In the following three years, three additional long-term lease transactions took place. Since 2008 only once lease transaction has occurred: the PR-22/PR-5 toll roads in Puerto Rico in 2011. While other project owners have considered leasing toll facilities, no other lease concessions have occurred in the ensuing time.

Long-term lease concession can take several forms. These include:

- **Debt transfer lease transactions** where a fee paid by the private concessionaire is used to defease the toll facility's underlying publicly-held debt, with no additional funds available to the public sponsor. Such transactions require the private concessionaire to maintain the road to specified standards throughout the concession period and may also require the private investors to make additional capital repairs to address safety and condition issues.

- **Hybrid debt transfer and new construction lease transactions** where the private investor pays a fee that is used to defease the underlying publicly-held debt on the facility and agrees to complete new center-line construction extending the existing toll facility. With this model additional payments in excess of the debt underlying the existing road are not made. In some cases, new construction may only be required at a future point in time if certain predetermined performance levels are achieved.

- **Value extraction lease transactions** where a fee paid by the private investor is used to defease any underlying public debt associated with the toll road and provide the public sponsor leasing the facility with a sizeable infusion of additional funds that it can use for other needs. These transactions require the private investors to maintain the road to specified standards throughout the concession period and may also require the private investors to make additional capital repairs to address safety and condition issues.

<Table 4: Long-Term Lease Concession>

Project	Chicago Skyway	Indiana Toll Road	Pocahontas Parkway/ Richmond Airport Connector	Northwest Parkway	PR 22 and PR 5 Lease
	2005	2006	2006	2008	2011
Location	Chicago,Illinois	Northern Indiana	Richmond, Virginia	Metropolitan Denver, Colorado	Puerto Rico
Facility Type	Toll Road	Toll Road	Toll Road	Toll Road	Toll Roads
Length	7.8 miles	157 miles	8.8 miles	8 miles	52/2.5miles
Cost*(millions)*	$1,830	$3,948	$766	$726	$1,146
PPP Basics					
Type of PPP	Brownfield	Brownfield	Hybrid	Brownfield	Brownfield
Concession Length	99 years	75 years	99 years	99 years	40 years
Financial Close	1/26/2005	6/29/2006	5/16/2006	12/21/2007	9/11/2011
Status	Open	Open	Open	Open	Open
Funding & Financing					
TIFIA				●	
PAB					
Commercial Debt	●	●	●	●	●
Public Sector Payment					
Private Equity	●	●	●	●	●
Special Facility Revenue Bonds					
Donated Right-of-Way					
Interest					
Milestone Construction Payments					
Tolls					
Bond Premium					
Other					
Source of Revenue					
Tolls	●	●	●	●	●
Availability Payments					
Concession Milestones	Refinanced 2005 Concession Sold 2016	Bankruptcy filed 2014 New Leasea warded to IFM Investors 2015	Concession transferred to creditors 2012 New Lease Awarded 2016	Concession Sold 2013	Short-term debt refinanced 2015 Concession extended 10 years 2016

5.4.1 Experience on Long-term Lease Concession

Table 4 summarizes the five long-term lease concessions in the U.S. to date. Concession periods tend to be longer than with real toll DBFOM and availability payment concessions, averaging about 82 years. Only the Puerto Rico lease is less than 75 years, although it was extended from 40 to 50 years in 2016.

All long-term leases include a commitment to operations and maintenance over the concession term. However, unlike similar commitments for availability payment concessions, adhering to established performance standards is not as easily enforced since there are no performance-based availability payments. Two lease transactions have included provisions for facility expansion: the Pocahontas Parkway where the concessionaire constructed a connecting road segment to Richmond International Airport, and the Northwest Parkway, which includes options for two extensions of that facility. Other commitments bundled with long-term leases have included upgrading toll collection systems, capital maintenance, and other safety and system improvements.

Experience with long-term leases in the U.S. has been decidedly mixed. Most long-term lease concessions are no longer held by their original private sector concessionaires. Although the Chicago Skyway's investors sold their interests in the facility for a profit in 2015, 10 years into the lease, both the Indiana Toll Road and Pocahontas Parkway struggled to achieve adequate traffic and revenue levels sufficient to cover their debt repayments. The Indiana Toll Road's concessionaire filed for bankruptcy in 2014, and the lease was subsequently auctioned off to a new private sector consortium. The Pocahontas Parkway's concessionaire ultimately transferred ownership of the roadway to the banks holding its senior debt in 2014, and subsequently VDOT awarded

a concession to a new private consortium in October 2016.

The Northwest Parkway's concessionaire reported "favorable" performance evidenced by 15.2 (2014) and 41 (2015) percent increases in toll revenue, along with respective 13.3 and 12 percent growth in traffic due to strong economic activity in the Denver metropolitan area[19]. Nonetheless, prior years of underperformance and an inability to restructure private debt maturing in 2017 led the concessionaire to sell the toll road to new investors in late 2016.

The PR-22 and PR-5 concessionaire refinanced its shorter-term debt in December 2015 extending the payback period and stabilizing the facility's finances. The concession agreement also was extended by 10 years in April 2016 in exchange for an additional payment from the concessionaire to the project sponsors of $115 million. In conjunction, the concessionaire's revenue share was increased from 50 to 75 percent of future toll revenues. Traffic levels have shown recent improvement despite unfavorable economic conditions in Puerto Rico[20]. Ninety-five percent of the concessionaire's five-year investment plan to make operational improvements to the roadways is complete.

While several initial private sector investors have been challenged to realize expected returns from their investments in the near-term, public sector sponsors have generally benefited from their long-term lease transactions. First, changes in lease ownership have not had an impact on facility users or project sponsors since the provisions of the original concession

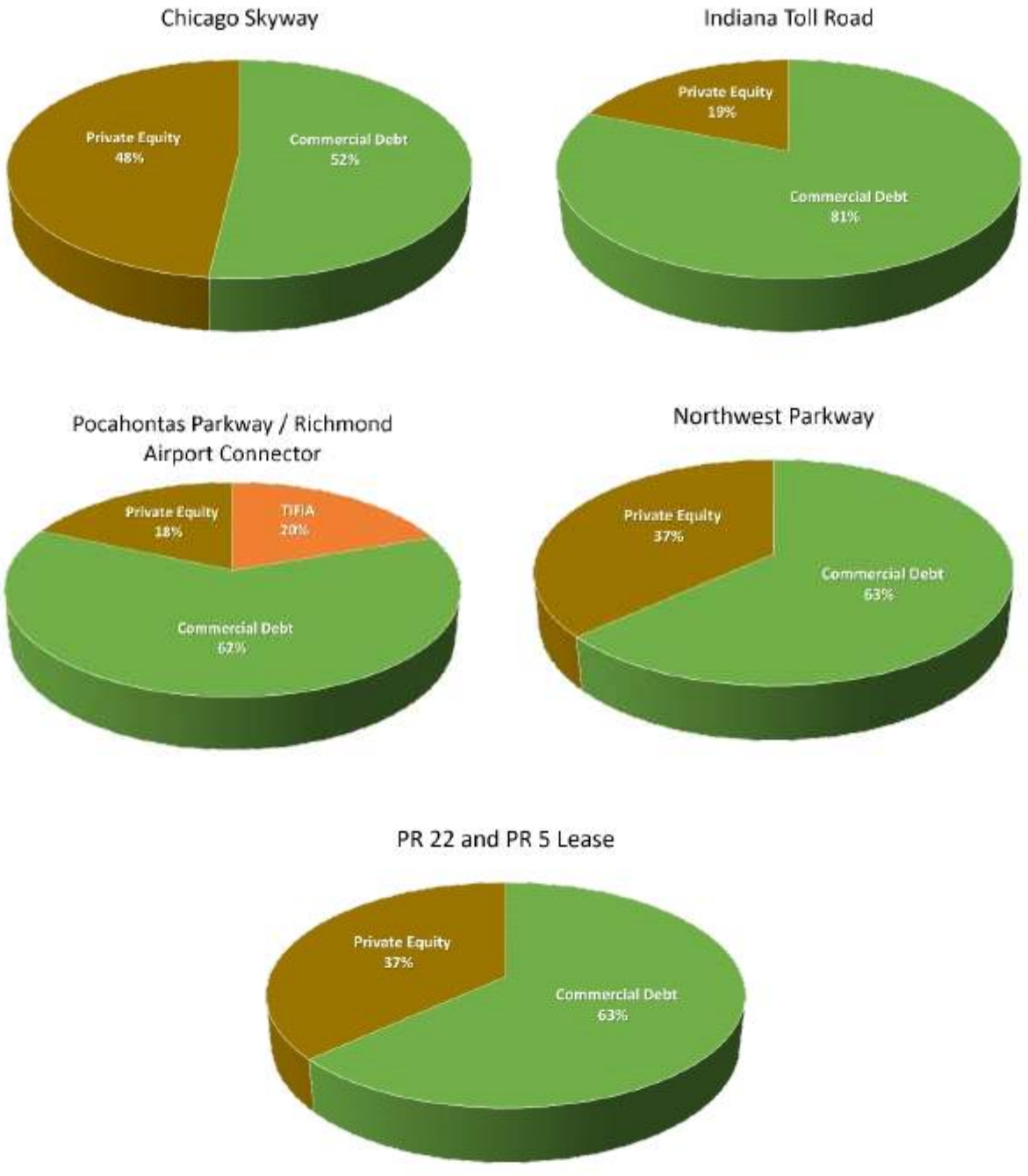
19) Brisa 2014 and 2015 Consolidated Annual Reports. http://www.brisa.pt/Portals/0/Documentos/Relatorios/EN/RC%20Consolidados/ReCBAE_Cons_2014UK.pdf

20) Abertis 2015 Annual Report. https://www.abertis.com/media/annual_reports/2015/IA2015_abertis_eng_bP7VWsH.pdf

agreements, including commitments to operate and maintain the roadways, to follow established methods for toll rate increases, and to share excess profits still stand. Second, the large, upfront payments secured upon lease execution have provided demonstrable benefits. At a minimum, they helped retire debt on burdensome or troubled assets for all five projects, and in three instances, permitted the project sponsors to make investments elsewhere in their respective region or State. Both the Chicago Skyway and Indiana Toll Road exemplify this outcome, as the City of Chicago and State of Indiana were able to make substantial investments in infrastructure, and in the City of Chicago's case, to parlay the proceeds into social and future income generation benefits as well.

However, in order to achieve these results, each of these sponsors had to forego the income that these existing toll facilities would have provided them over the life of these extremely long concession terms. While it may have been more difficult politically and from a public acceptance perspective, the project sponsors could have implemented toll increases and streamlined operation of their existing toll facilities in ways emulating what their private sector operators have accomplished. With mature legacy facilities such as in Chicago, Indiana and Puerto Rico, the income that has been forfeited for periods up to 99 years is substantial. These sponsors did receive extremely large payments for these leases that provided capital funding for other project needs, and in the case of Indiana to fund the $2.6 billion, 10-year, Major Moves transportation investment program, advancing the benefits of the projects undertaken.

<Figure 4: Long-Term Lease Sources of Funding>



5.4.2 Financing Long-term Lease Projects

As shown in Figure 4, original financings for long-term lease concessions in the U.S. have all comprised significant private equity investment coupled with taxable long-term debt from commercial banks. The fact that these legacy facilities have well established traffic and revenue histories mitigates traffic risk, thereby making commercial debt a viable option for their private sector operators. Given that Federal credit programs must be used on projects involving the expansion of existing facilities or the construction of entirely new projects, they have not been available for use on long-term lease projects. The Pocahontas Parkway lease transaction did include a TIFIA loan, which the concessionaire used to help finance the construction of the Richmond Airport Connector.

The percentage of equity as a share of overall concession cost at initial financial close ranges between 18 (Pocahontas Parkway) and 48 percent (Chicago Skyway), with an average of roughly 32 percent. However, the Chicago Skyway concessionaire refinanced its underlying debt only seven months after financial close, reducing its equity share to 25 percent. This change reduced the average level of equity investment for the five long-term lease transactions to 27 percent.

6. Conclusion

The practices of PPP in the U.S. provide some implications regarding government's fiscal integrity.

PPP projects have been less prevalent in the U.S. than in many other countries in part due to historic public policies that have led to large Federal investments via grants-in-aid for highways discouraging the construction of toll roads. Federal regulations that prohibit tolling of the Federal-aid highway system and constraints on Federal tax exemption for financing and long-term leases have the potential to limit the use of PPP. In addition, Strict electing processes like feasibility study or VfM analysis made it possible only a limited number of project could be implemented. Sometimes, this resulted in a serious loss for private investors but, in many cases, gave a big profit to the government.

As analyzed earlier, indirect assistance from the Federal Government through financial institution like TIFIA and PAB played a key roll to facilitate PPP in the U.S. In 1998, TIFIA credit program was created to provide access to much needed capital for critical transportation projects facing challenges accessing debt through the regular capital markets. TIFIA credit assistance also provides loans at attractively low interest rates tied to U.S. Treasury bonds. In 2005, SAFETEA-LU act was amended to add highways and freight transfer facilities to the list of privately developed and operated projects for which PABs may be issued. TIFIA and PAB dramatically lowered the cost of finance and broaden the possibility of feasibility for the private sector without giving a big burden to pubic agency. On the other hand, there were not many cases of government's direct support such as construction subsidy which could have made serious fiscal burden

to the government.

Creating quality competition during the procurement phase is vital. Public agencies benefit the most when multiple bidders submit quality proposals generating robust competition between the most capable private firms. This increases the likelihood that the winning bid will be the best choice for delivering a project that achieves public goals.

In order to obtain the best value for the public, the public agency should create sufficient market interest for the project. During PPP project development, public agencies can stimulate market appetite by actively seeking industry input. Additionally, as discussed above, openness in communication and transparency in all aspects of the PPP process, including the award criteria, provide legitimacy to the procurement process and thereby increase market appetite.

While transparency and outreach efforts are mandated by laws, regulations, and general principles of good governance, it is particularly important that PPP projects are clearly explained to all public stakeholders and that public input is solicited early and throughout the process. Having upfront legislative involvement and approvals for PPP projects further creates transparency at the policy-making level and reduces surprises in a PPP procurement.

In the project development and procurement phases, communicating the result of project analyses and bid evaluations and reporting that the PPP will create public value is necessary to engender trust in the process. During procurement, a lack of transparency in interactions with the industry can be a source of criticism of PPP. Creating a transparent procurement process is critical for developing and maintaining public support. As discussed below, these practices also foster healthy competition.

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