

# **Public Private Partnerships in the Transportation Sector: An Overview and Case Studies in the United States**

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## **Abstract**

Constraints on traditional funding, concurrent with the need to invest in public infrastructure, has led many U.S. public agencies to explore public private partnerships, also known as PPP or P3, for the construction, and in some cases operation, of public infrastructure such as roads, bridges, and airports. Many attribute the initiation of modern P3 to Europe, where it has been used since the early 1990s. Thirty-three states, the District of Columbia and Puerto Rico have enacted legislation to support the use of P3 for highway projects, and P3 have been successfully used in other sectors such as water and wastewater, the power industry, building construction, and technology. P3 may be used for 1) new facilities such as design build, design build operate and maintain, and design build finance and operate, 2) existing facilities, such as long term leases, and operation and maintenance concessions, and 3) hybrid models, which may incorporate a long term lease for operation and expansion. This paper reviews the current framework for P3 in the United States, including enabling legislation, trends, and case studies of transportation projects in the roadway and airport sectors. In many PPP cases, the required demand and projected revenue did not materialize, and the private entity could not meet their obligations and make a profit. An analysis of the factors that will affect successful implementation given the current trends and challenges of P3 is provided to ensure successful infrastructure construction projects in the future.

## **Keywords**

Public, private, partnerships, PPP, transportation infrastructure, construction, roads, airports

## **1. Introduction**

Public Private Partnerships (PPP), also referred to as P3, have been increasingly utilized as both funding constraints and the transportation infrastructure needs have increased. P3 have been utilized at the state and local levels for a variety of transportation projects, including road, bridge, monorail and airport projects.

Many attribute the initiation of modern P3s to Europe, where they have been used since the early 1990s. The U.K. was one of the first to use P3s, through programs such as the Private Finance Initiative, which was announced in 1992 with the intent of increasing the role of the private sector in the provision of public services (Allen, 2001). Since its inception, the use of P3s in Europe has grown substantially: in 1990 there were two projects totaling approximately 1,400 million euros, and by 2007 there were 136 projects totaling almost 29,600 million euros; however, P3 projects decreased in subsequent years due to the financial challenges which began in 2008. While projects in many sectors utilize P3s, transportation

projects have traditionally accounted for the majority of projects in Europe; and most of the transportation projects are roads (Kappeler and Nemoz, 2010).

P3s have also been used increasingly in the U.S. for the construction of transportation projects. Thirty-three states, the District of Columbia and Puerto Rico have enacted legislation to support the use of P3s for highway projects, and P3s have been successfully used in other sectors such as water and wastewater, the power industry, building construction, selected airport applications, and technology. P3s may be used for new facilities such as design build, design build operate and maintain, and design build finance and operate; existing facilities, such as long term leases, and operation and maintenance concessions; and hybrid models, which may incorporate a long term lease for operation and expansion. Although there is increasing innovation for P3s, the majority of P3 approaches have been traditional, with 70 percent design build, 11 percent concession, 5 percent design-build-finance-operate and 5 percent design-build-finance (AECOM, 2007).

The U.S. federal government encourages P3s to be considered for surface transportation projects, and has developed resources to support P3s. These resources generally come through the federal Office of Innovative Program Delivery, which provides information and assistance for P3, including the Special Experimental Project Number 15 (SEP-15) program, Private Activity Bonds (PABs) and the Transportation Infrastructure Finance and Innovation Act (TIFIA) Federal credit program. SEP-15 is authorized by section 502 Surface Transportation Research of title 23 Highways of the US Code (Cornell University Law School, n.d.; Legal Information Institute, n.d.). The SEP-15 program is intended to promote P3, reduce construction time and encourage innovation. SEP-15 allows projects to be undertaken with innovative delivery techniques that would otherwise be prohibited by title 23 of the US Code, Federal Highway Administration (FHWA) regulations or policy. For a project to be undertaken under SEP-15, the State DOT must submit an application to the FHWA Division Office, which will be the basis for a negotiation of an Early Development Agreement (EDA), which outlines the framework for the approved experimental and innovative delivery features (FHWA Innovative Program Delivery, n.d.).

PABs are issued by local or state governments to fund a project for a private entity. These bonds provide higher yields due to favorable tax treatment (vLex, United States, n.d.). Traditionally, public facilities which generate revenue could be financed with tax-exempt revenue bonds. The use of a PAB allows the same tax-exempt mechanism, with the government borrowing money from private entities. The funds are secured through future expected revenues rather than the government agency's full faith and credit. The interest income earned on the bonds issued by a government agency to finance a project by a private company is exempt from local, state and federal income taxes, as long as it is for an approved public purpose (Michigan Economic Development Corporation, 2012).

Federal credit assistance to transportation projects of regional or national significance is provided through TIFIA, which has funded \$9.8 billion to support \$38.1 billion in transportation project investments to 28 projects in 11 states, Puerto Rico, and District of Columbia. To provide an idea of the scale of the projects, one of the smaller projects funded under TIFIA is Interlink, an \$42 million intermodal station in Rhode Island, and one of the larger projects is the \$900 million Central Texas Turnpike System (FHWA Innovative Program Delivery, n.d.). The TIFIA program has been used to facilitate funding for large projects through improved access to capital, flexible repayment, and lower interest rates. Under MAP-21 legislation, the TIFIA will have approximately \$690 million available in FY 2013 and \$920 million in FY 2014 to provide credit subsidy support to projects (FHWA Innovative Program Delivery, n.d.). FHWA promotes innovative delivery systems that reduce project delivery time (FHWA EDC, n.d.). P3s may be one way to shorten project delivery, especially if the participation of a private entity can expedite financing or other potential obstacles that may be present in traditional construction methods.

The Federal Aviation Administration (FAA) oversees funding for airport construction. The FAA has provided approval for a number of privatization and P3 projects, including the Luis Munoz International

Airport (Puerto Rico Public-Private Partnerships Authority, n.d.), and more recently, Gary/Chicago and LaGuardia International Airports. A P3 structure may be more desirable than a privatization project for a number of reasons. There may be advantages to the public airport maintaining the required federal certification through 14 CFR Part 139 rather than having a private entity obtain this certification, to assure access to publicly funded tax exempt bonds. Although the Airport Privatization Pilot Program (APPP), promulgated as part of the Federal Aviation Reauthorization Act of 1996, allows the collection of Passenger Facility Charges (PFCs) and Airport Improvement Program (AIP) grants, the local match for AIP funded projects increases for private entities. The incentive for privatization of airports is reduced by federal grant obligations that require reinvestment of airport revenues for the airport and do not allow the airport to retain profits or use airport revenue for non-airport purposes. Although many of the provisions can be waived by the Secretary of Transportation, the administrative burden to do so may be significant, and the incentives for the private sector are limited relative to the investment required. Applications for APPP program are shown in Figure 2, however, only two of the airports shown in Figure 2 were privatized, Stewart International Airport in eastern New York State and Luis Munoz Marin International Airport in Puerto Rico. The contract for private operation at Stewart was terminated early, and Luis Munoz Marin is the only airport currently privatized per the FAA APPP. The only airport with an active application for the APPP program is the Airglades Airport, a general aviation airport in Florida (Governmental Accountability Office (GAO), 2014).

Another limitation of airport privatization is the need to coordinate not only with the FAA and the airport owner, but also with local community stakeholders and other constituents such as the airlines. Airlines may have significant decision-making authority if the airport operates with a residual-cost approach, in which the airlines assume financial risk and agree to cover the costs associated with airport operations that exceed the revenue generated, and consequently play an important role in airport decision making. This highlights the fact that in many regards, airports already operate some activities using a public private partnership model, in which risk is shared between public and private entities, although not in exactly the same framework that is utilized for road, bridge and other infrastructure projects. Privatization outside of the APPP is also possible. For example, Branson Airport in Missouri was initiated in 2007 (before the economic downturn in 2008) and constructed in 22 months using \$60M in private investment and \$114M in tax-exempt bonds through the Branson Regional Airport Transportation Development District. Privately developed and operated with a long-term lease between Branson Airport LLC and Taney County, the airport had strong passenger traffic in early years but reduced traffic in recent years (GAO, 2014).

As assessment of P3s identified a number of critical success factors for P3s (AECOM, 2007), as follows.

- Stakeholder support and participation, including on-going public outreach and communication
- Public sector involvement to monitor the project
- Political leadership by senior public officials
- Secure public control that allow the government to take control to continue delivery of services, if necessary
- Limit complexity of P3s to reduce administrative costs and to encourage more potential bidders
- Appropriate risk sharing and rewards, with clear designation regarding responsibility for different risk factors
- Effective working relations among partners, including the public agency, large firms and smaller contractors who may participate as subcontractors because they are not large enough to take on the risk of P3
- Transportation agencies must have legal authority to undertake P3

The following case studies illustrate how P3s have been utilized to support transportation infrastructure in the U.S.

## **2. Case Study I, Design Build of 248 Bridges in Missouri**

The Missouri Department of Transportation (MoDOT) is responsible for 10,405 bridges, the seventh largest state inventory nationwide). In 2009, approximately 1,100 of these bridges were in poor or serious condition (MoDOT, 2013). In response to this challenge, MoDOT initiated the Safe and Sound Bridge Improvement, which replaced 802 bridges in 111 of Missouri's 114 counties that were in either poor or serious condition (HNTB, 2010). In the first phase, 248 bridges were rehabilitated through a modified design-bid-build contracting process (ENR Midwest, 2010). The bridges were grouped based on bridge size, type and location (KTU Constructors, n.d.) and put out to bid in these groups to expedite the design and construction process. More than 100 of the bridges were completed between April and November 2009, with a new bridge opening every day and half.

The second phase of the program was a \$487 million design-build contract for the replacement of 554 bridges and was awarded to KTU Constructors, a collaboration of Kiewit Western Company, Traylor Brothers, Inc., United Contractors, Inc., HNTB Corp, and The LPA Group, Inc; Missouri-based subcontractors and materials suppliers were also utilized (MoDOT, n.d.a). The resulting bridge construction allowed completion in less than half the time realized under more traditional procurement methods (45 days vs 90 to 110 days (FHWA Focus, 2010), and resulted in overall project completion in 3.5 years rather than the 5 years originally planned (MoDOT, 2013). Expedited delivery, which benefits the public agency, private partners, and the public, was realized through economics of scale associated with the large number of bridges constructed and use of prefabricated components, which reduce delivery time as well as labor costs. The program, which was estimated to save more than \$500M as compared to a more traditional contract model (MoDOT, 2013) was financed with bonds that will be repaid with annual payments of \$50M from the Federal bridge fund. The program was initially expected to be a privately financed design-build-finance-maintain program, however, the downturn in the financial market in 2008 resulted in higher costs for private financing, which would have cost \$500M more than the public financed program that was implemented (MoDOT, 2013).

The construction was completed by the private entity, however, MoDOT provided public information, including outreach and information about schedules and detours, throughout the project. Research has highlighted the importance of an external focus on community stakeholders as important factor for success (Verweij, 2014), and in this case the public partner was in a strong position to successfully serve in this important role.

While other State DOTs have implemented P3 projects, none have done it on the scale in Missouri. This case study illustrates the potential for P3 contracts to reduce delivery time, and the role that both public and private partners can bring – in this case the public entity provided financing and public involvement, and the private entity provided construction efficiency and expedited delivery on a large scale.

## **3. Case Study II, Lease of 156 Miles of Indiana Toll Road**

Heralded as a revolutionary contract due to its magnitude, the \$3.8B, 75-year lease of 156 miles of freeway across northern Indiana from Chicago, Illinois, to the Ohio border was finalized in 2006 with the ITR Concession Co, a consortium of Spanish company Ferrovial SA and Australian investment bank Macquarie Group LTD. The funds that resulted from the lease were used for local and state transportation projects across the state, as well as to support economic development in the toll road corridor. The projected revenues proved overly optimistic due to the economic downturn and reduced interstate commerce ((Palank, 2014), and national trends of stagnant vehicle miles of travel. As a result of these factors, in October 2014, the ITR Concession group requested and gained approval for a bankruptcy plan to seek out a buyer. If a buyer is not found, additional loans or financing can be sought.

Although the \$3.8B lease payment is a positive for Indiana, the benefits are tempered by the contractual challenges the state now faces. Given the current revenue stream, it is unlikely that a buyer will be interested in purchasing the lease, in which case it will revert to the state, theoretically. The complexity of the contract, however, makes the reversion to the state a complicated endeavor. Moreover, the financial difficulties faced by the toll road consortium have limited construction, maintenance and operations activities, resulting in closures of important ramps, deferred maintenance that may affect pavement life, and inadequate conditions at the toll road service plazas (Waltz, 2014).

The challenges currently faced by the possible transition of the toll road back to the state illustrate the need for a contract that clearly addresses responsibility and protocol for all possible outcomes. In the words of Indiana State Senator Brant Waltz, “Either members of the Indiana General Assembly were intentionally misled, a multibillion dollar contract was negligently written, or the agreement was changed at the last moment without anybody bothering to inform the Indiana General Assembly. (Waltz, 2014)”

This case study illustrates the challenges with accurately forecasting demand and revenues, and the need for clear and binding contracts that address every possible outcome.

#### **4. Case Study III, LaGuardia Airport Central Terminal Building Replacement**

Private participation in the construction and operation of airport facilities is widely accepted in many circumstances, including parking facilities, t-hangers and aircraft maintenance facilities, and the redevelopment and operation of terminal concessions areas (e.g., Los Angeles World Airports (LAWA), 2010, City of Chicago, 2011). In many cases, these projects get very little public attention, perhaps since the public private partnership is a very traditional way to do business, and perhaps because these projects do not constitute private participation in infrastructure that would typically be publicly provided. Private participation may also be utilized in the development of commercial buildings on airport property. In many cases airport property is extensive to allow future expansion, ensure runway protection zones, and ensure compatible land uses. The large land holdings for many airports (e.g., 33,500 acres at Denver (FAA, 2014) and 17,000 acres at Dallas Fort Worth (DFW, 2015), make it possible for airports to negotiate a variety of P3 opportunities for development and construction on airport property.

LaGuardia Airport is one of New York’s three primary commercial airports and one of the nation’s busiest airports with over 12 million passenger enplanements. A P3 contract was recently awarded for replacement of the Central Terminal Building (CTB), the frontage roads, aprons, utilities and central heating and refrigeration plant. The contract includes the financing, design, construction, maintenance and operation of the terminal during and after construction, demolition of the existing facilities, management of airline and non-airline tenants transition to the new terminal building, and operation and maintenance of the new central heating and refrigeration plant.

The P3 team is LaGuardia Gateway Partners, a consortium that includes Skanska, Parsons Brinckeroff, Walsh Construction, Vantage Airport Group, and Meridiam Infrastructure. Although the project is just getting underway, it illustrates the potential breadth of future opportunities for P3 to participate in airport infrastructure.

One reason LaGuardia initiated a P3 project was the successful implementation of a P3 at JFK Airport, where a consortium of private investors own and operate the 1.5M sf Terminal 4 (NYC Aviation, 2012), the largest public-private airport infrastructure development in the U.S. when it opened in 2001 (National Council for Public Private Partnerships, n.d.).

Although the JFK terminal was a success, there are challenges associated with maintaining successful airport operations by a private entity and not all ventures have been successful, as evidenced by terminations for airport operation by private contractors at Indianapolis, Stewart, and Midway Airports.

There are other limited examples of successful P3 projects, notably the McNamara Terminal in Detroit, a \$1.2B terminal project which was successfully completed and financed through a P3 partnership between Wayne County, the airport owner, and Northwest Airlines. In this project, Northwest Airlines was the developer and general contractor on the project, and continues to operate the terminal, although Wayne County remains the owner of the terminal (GAO, 2014).

Although in early stages, this case study illustrates the opportunity for additional P3 projects at airports in the wake of other successful P3 airport projects, in this case the new P3 project at LaGuardia which follows the successful Terminal 4 project at JFK. The airport owner, local stakeholders and airlines are all willing to undertake additional P3 projects when experience illustrates the benefits.

## **5. Case Study IV, Development Rights for Gary/Chicago International Airport**

The Gary/Chicago International Airport is south of Chicago in northwestern Indiana. This location suggests a strong potential for growth in the future, particularly if the airport can extend its main runway to accommodate larger planes, an extension which requires relocation of a railroad embankment. Moreover, unless the runway extension is completed, the FAA will require the current runway to be shortened due to a lack of an adequate safety area around the existing runway (Associated Press (AP), February 2014). This is one of the primary tasks and opportunities for Aviation Facilities Co (AFCO), the private operator of the Gary/Chicago International Airport, that has a 10-year contract to run the airport (which may be extended up to 30 years), and exclusive rights to develop airport real estate for 40 years. The contract is a limited privatization, since the operation is maintained under municipal control although the AFCO will provide management. The contract requires AFCO provide the authority with a plan for attracting \$75 million more in investment by 2054 within one year, and secure \$25M in private investments within three years; if these obligations are not met, the contract can be reduced to five years. If \$25M in private investment is not secured within five years, the contract can be terminate. (AP, January 2014).

This case study illustrates the value of maintaining municipal control for airports which ensure the availability of AIP funds and negates the need for participation in the APPP. This case study also emphasizes not only the large investment required for transportation infrastructure, but also the need for contingency plans if anticipated funding is not realized. In this case the risk for the municipality is relatively low, since the primary potential loss is the opportunity cost for the realization of the needed airport improvements.

## **6. Discussion - The Future of P3**

Numerous P3 ventures for transportation infrastructure have been successful, however, in recent years, there are also an increasing number of P3 projects that have not been successful, illustrating the potential pitfalls both for the public and for the private entities involved. In many cases, the required demand and projected revenue did not materialize, and the private entity could not meet their obligations and make a profit. These challenges highlight the importance of clear contracts in the event of default by the private entity.

Successful P3 projects build on the strength of both public and private partners. Strengths of private partners may be increased efficiencies, the ability to capitalize on economies of scale, and the ability to provide private financing. Strengths of public partners may include strong relationships with community stakeholders and other external partners, which are critical to project success, and may determine the success not only of the current project, but also the opportunities for future projects.

To be successful, it may be important for future **P3 PROJECTS** to be tailored to meet the specific project needs. Although not strictly P3, an innovative contract for the construction of O'Hare Terminal 6

provided an at risk approach which allowed the City of Chicago, the owner, to review the design process at 30%, 60% and 100% stage, with the option of utilizing a lump sum cost at the 30% milestone, and negotiations for the final cost to be locked in at the 100% design completion milestone. If negotiations could not produce concurrence for the final cost, Chicago could have shifted to a traditional approach for the remainder of the project (Airport International, n.d.). This provides an example of a contract with well defined protocol to address a range of outcomes at various project stages. It also highlights the opportunity for contracts to be tailored to meet the needs of the client and project, with flexibility built in to address changing circumstances at various milestones in the project.

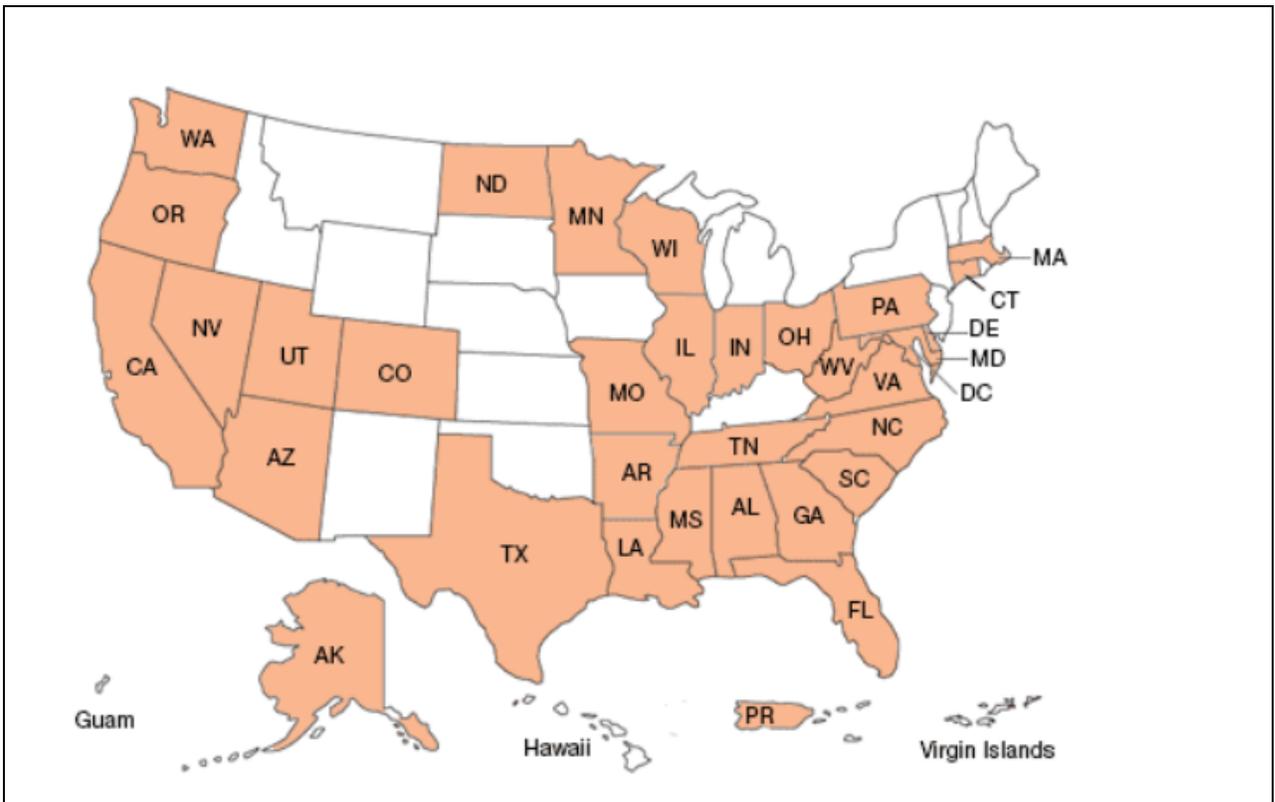
The US provides its own set of opportunities and challenges for P3s that may differ significantly from other parts of the world. For example, Ferrovial, S.A., is the Spanish company that leases the Indiana Toll Road, the Chicago Skyway Bridge, and numerous roads and airports in Europe, including London Heathrow, Glasgow, and Aberdeen Airports. While Ferrovial has demonstrated success in some projects (e.g., Chicago Skyway Bridge), it has faced dramatic obstacles in others (e.g., Indiana Toll Road), illustrating that even successful players may face challenges from a variety of fronts. While acceptance of P3 is growing in the US, there are some limitations for its successful implementation, particularly with respect to financing since private entities cannot procure publicly funded bonds, and there may be constraints with respect to profits, particularly at airports. To overcome these obstacles, the public agency can maintain ownership and contract out specific functions, such as construction oversight and management functions. It may also be possible to provide opportunities for real estate development rights, to compensate for the inability to provide profits for airport operation.

For surface transportation, legislation such as MAP-21 continues to support P3s. In fact, MAP-21 includes provisions requiring the Department of Transportation to assist states and public transportation agencies by providing specific information to support P3s (FHWA MAP-21, 2012).

- Publishing best practices illustrating how public entities can work with the private sector in the development, financing, construction, and operation of transportation facilities, including policies;
- Providing technical assistance regarding P3s including assistance in analyzing the value of P compared to traditional public delivery models; and
- Developing standard P3 model contracts for the most popular types of P3s, and encourage states, public transportation authorities, and other officials to use these model contracts as a base template for P3 agreements.

#### **4. Conclusion**

Public private partnerships have been successfully utilized for a variety of transportation facilities across the U.S. The success of these ventures, the support of federal agencies, and the interest of the private sector assure that they will continue to play an important role in the future construction of our nation's transportation facilities. Unsuccessful P3 projects have highlighted the challenges associated with forecasting demand and future economic conditions, and the need for clear and flexible contracts that address all possible outcomes, to protect the public and assure the continuous provision of critical transportation facilities.



**Figure 1. States with Legislative Authority for Design-Build (DB) and PPP for Surface Transportation Projects (FHWA, n.d.)**



**Figure 2. Applications for the Airport Privatization Pilot Program between 1997 and 2014 (GAO, 2014)**

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