

WHY DO U.S. STATES ADOPT PUBLIC-PRIVATE PARTNERSHIP ENABLING LEGISLATION?

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ABSTRACT

A growing number of U.S. states and localities are pursuing private investment in transportation infrastructure through public-private partnerships, or PPPs. As of late 2011, thirty states had enacted legislation enabling use of PPPs. This legislation clarifies such issues as the treatment of unsolicited PPP proposals, prior legislative approval of PPP contracts, and the mixing of public and private funds, among others. Using expert-weighting of thirteen key elements of PPP enabling laws, we develop an index reflecting the degree to which a state's law is encouraging or discouraging of private investment. We examine why states pass enabling laws, and why some states pass legislation that is relatively more encouraging of private investment. We consider demand side, supply side, and political drivers of passage. We find that vehicle registration growth, the level of traffic congestion, and a state's political disposition are important predictors of the passage of PPP legislation. We further find that traffic congestion, political disposition, and both the level and growth rate of per capita income in a state affect its law's favorability to private investment in predictable ways. There is little indication that traditional public finance variables, such as federal highway aid and federal gas tax receipts, are important. We motivate our analysis by showing that PPP enabling laws increase the likelihood of utilizing a PPP. Our findings are inconsistent with states passing PPP enabling laws simply in response to fiscal exigencies.

Keywords: Transportation infrastructure; public-private partnerships; private investment; state public-private partnership enabling laws; fiscal constraints

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I. Introduction

The supply of U.S. transportation infrastructure has not kept pace with rising intensity of use in the latter half of the 20th century. Between 1980 and 2008, for example, vehicle miles traveled (VMT) in the United States increased 96 percent, while highway lane-miles rose only 7.5 percent (Furchtgott-Roth 2010; Fischer 2005).² In addition to excess demand for new infrastructure, maintenance and renovation of existing aging transportation infrastructure coupled with declining fuel tax revenues is burdening traditional transportation financing sources.³

Many U.S. states and localities are considering alternative approaches to renovating, maintaining and financing transportation infrastructure. One alternative is to allow a greater role for private firms in those activities. The main vehicle to facilitate such participation is the public-private partnership, or PPP. The term “PPP” has evolved to encompass a range of contractual relationships between a public project sponsor and a private partner that facilitates a larger private role.⁴

² See e.g. Diana Furchtgott-Roth, Mileage Fees Over Gas Taxes? *Real Clear Markets*, May 20, 2010, available at: http://www.realclearmarkets.com/articles/2010/05/20/mileage_fees_over_gas_taxes_98477.html (accessed December 11, 2011) and Fischer (2005).

³ See Ron Hagquist, “Higher Gas Efficiency Equals Lower Fuel Revenues,” *Public Roads*, U.S. Department of Transportation, Federal Highway Administration, Vol. 71, No. 6, (Nov/Dec 2008), available at: <http://www.fhwa.dot.gov/publications/publicroads/08nov/03.cfm> (accessed December 11, 2011). As of 2009, almost 61,000 miles of the National Highway System were in poor or fair condition, while about one in four bridges were structurally deficient or functionally obsolete. See House Comm. on Transportation & Infrastructure, *The Surface Transportation Authorization Act of 2008: A Blueprint for Investment and Reform* (2009, p. 2). There is, however, evidence that some parts of the nation’s highway and tunnel system improved between 1997 and 2006 due to rising nominal investment. See, e.g. U.S. Department of Transportation, Federal Highway Administration, *2008 Status of the Nation’s Highway’s Bridges and Tunnels: Conditions and Performance*, “Highlights,” available at: <http://www.fhwa.dot.gov/policy/2008cpr/hilights.htm> (accessed December 15, 2011). State transportation funds are depleted for other reasons, including diversion of funds for non-transportation purposes.

⁴ The U.S. Federal Highway Administration definition of PPPs has now become standard: “Public-Private Partnerships (PPPs) are contractual agreements formed between a public agency and private sector entity that allow for greater private sector participation in the delivery and financing of transportation projects.” See U.S. Department of Transportation, Federal Highway Administration, *P3 Defined*, <http://www.fhwa.dot.gov/ipd/p3/defined/index.htm> (accessed September 2, 2010).

One recent step taken by states to facilitate private participation is the passage of laws that enable the use of PPPs. Commentators have suggested that transportation PPPs in the United States are hindered by a lack of state-level enabling legislation.⁵ The stated purpose of enabling laws is to attract private infrastructure investment to the state.⁶ The laws also describe the institutional framework surrounding private infrastructure investment. This includes such issues as acceptance of unsolicited PPP proposals, whether a PPP may be used on existing as well as on new transportation facilities, whether agreements may include revenue sharing with the public sponsor, and whether non-compete clauses may be included in the agreement, among many others.⁷

From the private sector's perspective, it is risky to direct time, money, and effort to developing infrastructure projects that ultimately fail to receive the necessary authorization. In addition to reducing uncertainty, enabling legislation provides a framework for contracting, promotes PPPs, and more clearly defines the allocation of risks between public project sponsors and private partners.⁸ Preliminary evidence, which we discuss below, suggests that PPP enabling laws are important in facilitating private investment in infrastructure.

Perhaps because of the tradition in the United States of heavy reliance on tax-exempt government bond financing, private investment in infrastructure remains low by global standards, and substantial controversy surrounding the use of PPPs to finance and operate transportation infrastructure remains.⁹ Critics argue that PPPs do not create net social value, merely remove debt from the government's books, raise the social cost of capital, and help to

⁵ See e.g. Fishman (2009) and Reinhardt (2011).

⁶ We provide several examples of state preamble language in Appendix B.

⁷ A list of key provisions is provided in Table 1.

⁸ Iseki, Eckert, Uchida, Dunn, & Taylor (2009).

⁹ Regarding low U.S. use of private investment in infrastructure, see Figure 1 on page 4 of Istrate and Puentes (2011).

protect the interests of private parties who exploit market power.¹⁰ One implication of these views is that states have little choice: they are forced by fiscal necessity to rely more heavily on private infrastructure investment, and pass PPP enabling laws accordingly. Others argue that PPPs can generate net social value through improved incentives to innovate, additional capital, greater contractual transparency, and improved linking of compensation to performance.¹¹ The implication of those views is that forces besides fiscal necessity may be at work. Those two perspectives are not mutually exclusive.

Our analysis does not address directly debate regarding the social value of PPPs. It does however contribute to our understanding of why states pass laws that explicitly invite private investment in transportation infrastructure, and the degree to which fiscal exigencies are forcing states to pass PPP laws (and to pass more favorable laws), or whether other forces are at work, such as a desire to alleviate congestion.

Despite their importance, there has been little detailed empirical examination of PPP enabling laws.¹² We examine empirically the underlying drivers of state enactment of PPP enabling legislation and, of those states passing laws, how favorable their law is to private participation. To examine the favorability of PPP enabling legislation to private investment, we catalog thirteen key elements of each law to develop a PPP enabling law “favorability index.”¹³

We conducted a detailed survey of PPP experts in the United States that allows us to assign

¹⁰ See e.g. Roin (2011), Dannin (2011), and Quiggin (2004), among others.

¹¹ See Geddes (2011) for a summary.

¹² To our knowledge, we are the first to empirically analyze state PPP enabling laws. There are, however, attempts to understand the determinants of public-private partnerships globally. See e.g. Hammami, Ruhashyankiko and Yehoue (2006). Importantly, those authors examine international data and find that effective rule of law is associated with more PPP projects. See also Istrate and Puentes (2011) for a discussion of the importance of various provisions of state PPP enabling laws.

¹³ We recognize that enabling laws most favorable to private investment may not best protect public interests. This raises the separate research question of which laws best control market power, ensure stewardship of public assets, and guarantee service quality, for example. A similar methodology of indexing state laws could be used there.

weights to various legal provisions based on how important PPP experts believe they are in attracting private investment.

We consider alternative theories of the enactment and content of PPP enabling laws. One approach suggests that states are responding to the wishes of motorists – customers – who use transportation facilities. States and localities are here understood to be using PPPs to increase the provision of a public good in response to customers’ demand for it. A second view suggests that states are responding to a supply-side problem, which is the lack of alternative (i.e. government) funding sources for transportation infrastructure, and thus turn to the private sector out of fiscal necessity. The third posits that laws encouraging private participation are a result of a state’s political predisposition, as well as non-customer pressure groups that may oppose or support private investment, such as labor unions. We consider a set of variables to assess each theory.

We estimate both the probability of passage and a law’s favorability (or un-favorability) to private investment.¹⁴ We use logistic regression to explore the effect of a number of variables on the probability that a state will enact a PPP enabling law, and both linear regression with panel-corrected standard errors and a Cox proportional hazard model to examine how those variables affect the favorability of a PPP enabling law to private investment. Using a variety of samples and specifications, and controlling for both time and regional effects, we first examine the reasons for act adoption. Our panel estimates indicate that vehicle registration growth, traffic congestion levels (measured through a travel-time index), and a state’s political disposition affect the probability of act adoption, while hazard estimates suggest that traffic congestion and a state’s political disposition are important.¹⁵ The effect of a state’s bond rating is not robust to the

¹⁴ Although our paper is not intended to be a guide for practitioners, our favorability index may assist states wishing to pass enabling laws in the future that serve to attract private infrastructure investment.

¹⁵ Many state laws mention in their preambles that one of their aims is to reduce congestion. We provide several examples of state preamble language in Appendix B.

inclusion of year fixed effects, but is robust to the inclusion of regional effects. We find that traffic congestion, a state's political disposition, and both the level and growth in a state's per capita income affect the laws' favorability to private investment. The unionization rate is not robust to the inclusion of region-fixed effects. We find that the amount of federal highway aid per capita improves the favorability of PPP enabling laws when considering a sample of states that eventually pass a law, but not for a sample of states using positive index values only.¹⁶ Our findings suggest that states are responsive to motorists' demand for more infrastructure but provide only weak evidence that states are passing PPP enabling laws, and more favorable laws, because traditional sources of infrastructure funding are constrained.

We describe the PPP approach in Section II. Section III discusses PPP enabling laws and why they are important in facilitating private investment. Section IV describes our data and predictions. Section V presents our empirical estimates, and section VI concludes.

II. Public-Private Partnerships in Transportation

Public sector officials have long relied on private contractors to provide a variety of services, such as the design and construction of transportation projects. Under the PPP approach, the private role is expanded to maintaining, operating, and financing transportation projects. Private participation includes the management, operation, and renovation of an existing facility, known as a brownfield project, as well as the design, construction, and operation of a new facility, known as a greenfield project. PPPs have been utilized to deliver transportation

¹⁶ We retain states that eventually passed laws but do not yet have positive index values to maintain sample size and to allow observation of which estimates are affected by the removal of states/years where index values were zero. When only positive index values are included, sample size drops by almost half.

infrastructure projects in many other countries, including Australia,¹⁷ Canada,¹⁸ the United Kingdom,¹⁹ France, Italy, Portugal, and Spain.²⁰

For both brownfield and greenfield PPPs with an operational component, the public project sponsor typically specifies in the contract how the facility is to be renovated, maintained, and expanded if necessary. The contract also specifies how tolls will be determined, as well as concession length. Key performance metrics can be included, such as safety standards and pavement quality, with well-defined penalties and rewards. Once the contractual structure is finalized, the public sponsor accepts competing bids on the basis of an upfront concession fee. PPPs have been used to help finance and build at least 104 transportation projects worth a total of \$54.3 billion since 1988.²¹ About eighty-one percent were for highways, bridges, and tunnels. Four transportation projects were brownfield leases and the rest were greenfields.

PPPs generate additional investment in transportation infrastructure because they provide access to new types of capital markets. Investment through PPPs is important, accounting for about 11 percent of all national capital investment in new highway capacity in 2011. Private investment in U.S. transportation infrastructure is also growing in importance, with a number of project agreements signed after 2008 despite the global financial crisis. From 2001 through 2010, five states on average started a new transportation PPP each year.²²

PPPs have broad relevance for urban economics. Although we focus on PPP enabling legislation that authorizes investment in highways, PPPs in the United States are not exclusive to highways or even to transportation projects. They have been used in the United States to provide

¹⁷ See, e.g. Allen Consulting (2007); Czerwinski & Geddes (2010).

¹⁸ See Vining & Boardman (2008).

¹⁹ Federal Highway Administration (2009)

²⁰ Albalade, Bel, & Fageda (2009).

²¹ Reinhardt (2011), and Istrate and Puentes (2011, p.3). We describe several transportation PPPs in detail in Appendix A.

²² Reinhardt (2011).

water and wastewater facilities, transit projects, prisons, military housing, and schools, among other facilities (e.g. Albalate, Bel, and Geddes (2011); and Albalate, Bel, and Geddes (in press)). PPPs can improve the time and cost certainty of projects (Allen Consulting Group 2007). They are also important for urban economics in that they enhance incentives to allocate capital to its highest valued use. Similarly, they avoid costly “white elephant” projects (Engel, Galetovic and Fischer 2002; Sadka).²³

III. Public-Private Partnership Enabling Laws

PPP enabling laws are important prerequisites for private infrastructure investment. PPP enabling legislation offers a more stable institutional and political environment to assure investors that they will in fact capture their anticipated returns, and reduces the likelihood of time-inconsistent behavior on the part of government that may reduce returns or expropriate sunk investment. A PPP enabling law can serve as a signal that a state is less likely to first permit long-lived, sunk private investments, and to later undertake actions that reduce the value of that investment.

One controversial example is enabling law provisions that either facilitate or restrict the use of contractual clauses regarding compensation for adverse events, or that restrict the use of (stronger) non-compete clauses. These are clauses requiring that private partners be compensated if the public sector constructs a competing facility that reduces revenues on the privately operated facility, which is an important risk.²⁴ Provisions allowing the use of non-compete and

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²⁴ An historical example illustrates the problem that free competing facilities can cause for private toll roads. On February 18, 1928, the U.S. Highway 11 bridge across Lake Pontchartrain in Louisiana was opened to traffic. The bridge is almost five miles long and carried over 23,000 vehicles per day in 2006. It was built with private funds as a toll facility by a group of contractors called the Watson-Williams Syndicate. Governor Huey P. Long, who campaigned on the promise of “free” bridges, entered office soon afterward and built competing un-tolled bridges at the Rigolets and the Chef Menteur Pass. The Watson-Williams Bridge suffered a severe drop in traffic and,

compensation clauses increase the security of returns on private investment, and make an enabling law more favorable to it.

The attempted lease of the Pennsylvania Turnpike speaks to the importance of enabling laws. In May 2008, the Pennsylvania state government announced that a partnership of Citi Infrastructure Investors and the Spanish firm Abertis Infraestructuras was chosen as concessionaire in a 75-year lease of the Pennsylvania Turnpike with a winning bid of \$12.8 billion. The state legislature, however, allowed the bid to expire by not passing the requisite enabling legislation. Substantial costs were incurred by generating bids for which there was ultimately no return, even for the winning bidder.²⁵ Those costs include holding in place commitments on \$12.8 billion in financing, which forestalled other uses for those resources.²⁶ Partly as a result of the events in Pennsylvania, *ex post* legislative approval for individual PPP agreements is seen as a large disincentive to private sector investment.²⁷ PPP enabling laws reduce the risk of such political vacillation by granting *ex ante* legislative approval.

consequently, in revenues. Its owners were eventually forced to sell it at a loss to the State of Louisiana. The effect on both equity and debt holders was ruinous (Geddes 2011, p. 131).

²⁵ Commentators consider such unrecovered bidding costs to be a significant deterrent to private participation. John Durbin, former executive director of the Pennsylvania Turnpike Commission, noted that “[t]here will not be another consortium that will proceed in any state where they have to put their bids in first and then gain legislative approval to lease the asset” (Pew Center on the States 2009, p.18). Regarding the Pennsylvania Turnpike lease, one PPP expert notes the deterring effect of such political risk on private investment: “As Karl Reichelt of the construction company Skanska notes, global firms are willing to assume all kinds of technical and other risks, but they deeply fear political risk—the possibility that their clients could do what Pennsylvania did two years ago. The state decided to privatize its turnpike, invited bidders to spend millions of dollars preparing bids for a long-term contract, and then dropped the whole idea at the last minute.” See Nicole Gelinas, “The Tappan Zee Is Falling Down,” *City Journal*, Spring 2011, Vol. 21, No. 2. The unexpected cancellation of the GA/I-75 and I-575 toll lanes PPP in December 2011 provides another example of lost bidding costs. See e.g. Peter Samuel, “Georgia shocks investor groups with abrupt cancellation of procurement for toll lanes concession on GA/I-75&575” *TOLLROADS News*, December 11, 2011, available at: <http://www.tollroadsnews.com/node/5661> (accessed December 15, 2011).

²⁶ See e.g. Peter Samuel, “Abertis-Citi likely to announce end of bid for Penn Pike next week – Turnpike Commission wins,” *TOLLROADSnews*, September 27, 2008. The lack of enabling legislation was dispositive for the investors in this case. As the above article states, “The Abertis-Citi current offer of \$12.8 billion for a 75 year lease/concession of the Pennsylvania Turnpike expires next Tuesday Sept 30, and signs are it won't be extended. Last week a senior officer of the two companies was saying that *without movement on enabling legislation this month, they were done*” (emphasis added).

²⁷ Rall, Reed, & Farber (2010). Several states nevertheless have provisions in their enabling legislation requiring legislative approval. Regarding the disincentive to invest created by legislative approval requirements, one

Additionally, PPP legislation provides a basic framework for public and private sector contracting, which reduces transaction costs.²⁸ PPP enabling laws typically outline basic contractual terms, so negotiation need only occur around certain non-standard provisions.

Finally, the existence of a PPP enabling law, and its favorability to investment, signals a state's commitment to private participation more broadly. This signal facilitates private investment by further reducing transaction costs, since the need for detailed contractual provisions protecting sunk investment is reduced. Fewer contingencies need to be specified in the agreement where there is a demonstrated statewide commitment to PPPs.

For these reasons, commentators suggest that a lack of enabling legislation at the state level is an impediment to PPP use in the United States, and conversely that PPP legislation provides an important foundation for private sector involvement in U.S. transportation infrastructure.²⁹ In addition, some observers suggest that states with the most attractive models of PPP legislation are receiving the greatest attention from the private sector.³⁰ Moreover, sixty - five percent of all PPP projects since 1989 have occurred in only eight states, and all of those states have PPP enabling legislation.³¹

Overall, PPP enabling laws are likely to be important in attracting private capital into infrastructure construction, renovation, and operation. When properly designed, they reduce uncertainty, establish pre-set guidelines, and lower the transaction costs associated with public-private partnerships. We next discuss our data and predictions regarding the drivers of passage of PPP enabling laws.

commentator claims that, “[i]n those states whose PPP enabling acts required legislative approval of negotiated deals no such deals were ever proposed.” Poole (2009).

²⁸ Iseki et al. (2009).

²⁹ See Fishman (2009). Istrate and Puentes (2011) suggest that states pass PPP enabling laws as one of their three key recommendations to attract private investment to U.S. infrastructure.

³⁰ Gilroy (2009).

³¹ Those states are Florida, California, Texas, Colorado, Virginia, Minnesota, North Carolina, and South Carolina.

Through December 2011 thirty states plus Puerto Rico had legislation giving explicit authority to the state, typically through an agent (such as the state Department of Transportation), to enter into PPP agreements.³² Figure 1 displays states with PPP enabling laws as of 2008, the end of our timeframe.

(Figure 1 here)

IV. Data and Predictions

We explore empirically why states pass PPP enabling laws, and what determines their relative favorability to private investment. We utilized the Federal Highway Administration (FHWA) website and several other sources to determine the states that have enacted PPP enabling laws.³³ All information was verified through examination of state PPP statutes and traced back to its passage using LexisNexis.

Our dataset indicates the year in which a state first passed a PPP enabling law. Our time frame begins with the passage of the first modern PPP law, Virginia's Highway Corporation Act of 1988, and ends in 2008, which is the last year for which we have complete data on independent variables. Although 30 states have PPP enabling laws as of this writing, one of those states (Massachusetts) passed its law in 2009, two states (Illinois and Maine) passed laws in

³² Istrate and Puentes (2011) list thirty-one states as having passed PPP enabling legislation as of December 2011. We list thirty because we do not consider Arkansas's legislation in our analysis of PPP enabling laws. The Arkansas statute dates back to 1927 and is very limited in scope. It essentially allows county courts to grant private franchises to persons to build toll bridges or turnpikes over or alongside any watercourse, lake, bay, or swamp with the approval of the federal government (Ark Stat. Ann. §§27-86-201). This statute is too simplistic given the complexity of PPP agreements occurring today. We thus consider modern PPP legislation to begin with Virginia's Highway Corporation Act, which was passed in 1988.

³³ Federal Highway Administration, *State P3 Legislation*, (available at: http://www.fhwa.dot.gov/ipd/p3/state_legislation/index.htm, accessed June 2, 2011). Additional sources include Pikiel & Plata (2008); Iseki et. al (2009); and Rall, Reed, & Farber (2010).

2010, and two states (Ohio and North Dakota) passed in 2011. As a result, 25 states are indicated as having PPP laws during our timeframe.³⁴

A. The PPP Legislation Favorability Index

We address two key empirical questions: (1) what factors are important in determining whether or not a state passes a PPP enabling law; and (2) what factors are important in determining the favorability of that law to private investment? Our first step was to examine the literature on PPP enabling legislation to determine which elements of the laws are considered most important.³⁵

Two key documents guided our decision about which provisions to include in the PPP law favorability index: Poole (1993) and Hedlund and Chase (2005). Poole cites several provisions that are likely to discourage private investment if included in PPP legislation: (1) requiring *ex post* legislative approval of individual PPP contracts; (2) prohibiting non-compete agreements; (3) disallowing state and local government funds from being combined with private funds; and (4) subjecting the private sector to state procurement rules.

Hedlund and Chase list twenty-eight “key elements” that should be included in PPP legislation, which are broadly consistent with Poole. The authors note the importance of procurement exemptions, as well as the ability to combine public and private funds. While procurement may help ensure fairness in the awarding of government contracts, conventional procurement laws are often outdated and ill-suited to the complexities of a PPP, and thus a

³⁴ Twenty-six states are documented as having passed a PPP law between 1988 and 2008 because New Jersey passed a law that expired in 2003.

³⁵ Much of the research in the area of PPP enabling legislation comes from so-called “secondary literature,” which includes government reports, working papers, and white papers, etc.

disincentive to private investment.³⁶ Allowing the combination of public and private sector funds greatly expands the private sector's investment opportunities. Hedlund and Chase also note the importance of protecting the confidentiality of trade secrets contained in PPP proposals, which helps prevent free riding off the bids of others and encourages more bids, and of allowing the public sector sponsor to receive unsolicited proposals.³⁷

Using those and additional sources, we selected thirteen key elements that comprise our PPP legislation favorability index, which are reported in Table 1.³⁸ To generate weights for each element, we conducted a survey of PPP experts that asked respondents to rank each provision on a five-point Likert scale ranging from “very discouraging” to “very encouraging” of private investment.³⁹ We then assigned each rank an integer value as follows:

- 0 = Very discouraging of private investment
- 1 = Somewhat discouraging of private investment
- 2 = No effect on private investment
- 3 = Somewhat encouraging of private investment
- 4 = Very encouraging of private investment

We calculated the mean value for each provision and divided it by four to produce a favorability score for each provision between 0 and 1. We call this the “survey-weighted enabling score” for that provision, as displayed in the second column of Table 1. Values below 0.50 indicate provisions that on average experts believe discourage private investment while values above 0.50 encourage investment. The table indicates that, in view of these experts, the

³⁶ Hedlund and Chase (2005) suggest that, for a PPP to occur, a waiver of some parts of conventional procurement regulations may be needed, and in some cases regulations need to be rewritten.

³⁷ For a critique of confidentiality in the PPP procurement process see Siemiatycki (2007).

³⁸ Additional sources include Fishman (2009); Iseki et al (2009); and Rall, Reed, & Farber (2010). Table 1 has 19 rows, but there are only thirteen elements that comprise the favorability index. This is because some elements can have either a negative or positive aspect. For example, a law may or may not require legislative approval of PPP agreements. These are part of the same element, but were asked about separately in the survey. An important research question involves creating and analyzing a similar ranking for all states, not only those with enabling laws. We leave that question for future research.

³⁹ Fifteen experts answered the survey. Table A3 in the appendix reports the distribution of experts across ten major organizational types, such as federal and state government, think tanks and academia. Experts are well-distributed across organizational types, with the exception of law firms and toll road operators. We thus have no reason to believe that our survey weightings are systematically biased.

most favorable provision to private investors allows public and private sector funds to finance a PPP project (score = 0.95), while the least favorable provision allows the legislature (or another public body) to reject a PPP agreement after it has been negotiated (score =0.05).

(Table 1 here)

We next examined each state’s enabling law to determine how many of the provisions listed in Table 1 that law contained. We then summed the survey-weighted favorability scores across provisions for each law, and divided the total by 13 (the total number of possible provisions in any given law) to generate an overall favorability index for each state’s law.⁴⁰

Table 2 shows the maximum possible favorability scores based on potential survey responses and actual survey responses. If, for example, every respondent had answered that a certain provision was “very encouraging” of private investment the maximum score for that one provision would be one. If every respondent had answered that every provision was “very encouraging” of private investment all provisions would have a score of one, and the maximum possible score for a state that had all thirteen provisions in its law would be ten. Based on survey responses the maximum possible score for a state that has the thirteen highest-scoring provisions in Table 1 is 8.5. The maximum score that attains in the data (across all years) is 7.5 (for Texas).

(Table 2 here)

A number of states replaced older laws with newer ones during our study period. We used LexisNexis to track changes in PPP laws since their inception, which we incorporated into the favorability variable. This provides a time-varying favorability score for each state that is between zero and ten. States without laws received favorability index scores of zero. Scores for each state are reported in Table 4, along with year of passage, while Table 3 provides summary statistics including dependent variables, which we discuss below. The mean favorability index

⁴⁰ We scale the favorability index to be between zero and ten to aid interpretation of regression coefficients.

score (averaged across all states and all years) is 0.949, which is largely driven by the states without laws and corresponding favorability index values of zero. In 2008, the mean favorability score of states with laws is 4.28 (see Table 4).⁴¹

(Table 3 here)

Our favorability index is consistent with conventional views regarding which states are more encouraging of private infrastructure investment. For example, Texas, Virginia, Georgia, and Florida are often cited as examples of states with favorable enabling legislation. Consistent with our contention that PPP enabling laws in those states facilitate investment, one commentator notes that, “[s]tates like Texas, Virginia, Georgia, and Florida are generally regarded as offering the best models [of PPP legislation], as evidenced by the fact that they are reaping the most private sector interest and investment.”⁴² Texas and Virginia had the two highest favorability index ranks as of 2008, Georgia had the fifth, and Florida had the seventh.

(Table 4 here)

Figure 2 shows the trend in the average PPP law favorability index over time. The solid line displays the sum of favorability scores across all states divided by 50. This provides a measure of average overall state-level favorability to private infrastructure investment in the United States, which rises over time. The lighter dashed line displays the total favorability score divided by the number of states having PPP laws in that year, thus measuring the average of extant PPP law favorability. Average favorability of extant laws rises over time, which indicates that states are replacing existing PPP laws with more favorable laws, or new states are passing more favorable laws on average, or both. We next discuss several theories of why governments

⁴¹ Because some enabling laws are missing some provisions, a mean favorability score below 5 should not be interpreted to imply that PPP laws are, on average, discouraging of private investment.

⁴² Gilroy (2009, p.14).

are enacting PPP enabling laws, and why those laws may vary in favorability, and discuss variables we use to test those theories.

(Figure 2 here)

B. *Infrastructure Demand*

One theory of the passage of PPP laws is that governments are responding to rising motorist demand for additional transportation infrastructure and for renovation of existing infrastructure. Studies cite rapid population growth, increased VMT, and rising traffic congestion as reasons why states utilize the PPP approach.⁴³ Legislators themselves tend to cite such demand characteristics when passing PPP legislation.⁴⁴

If a state's legislature seeks to increase private participation in response to rising travel demand, then those variables will positively affect both the probability of passing a PPP law and the favorability of PPP laws. Our demand variables include year-over-year population growth, motor vehicle registration growth, VMT growth, and the travel time index (TTI), which is a measure of congestion calculated by the *Texas Transportation Institute*.⁴⁵ A travel time index of 105, for example, indicates that a trip in the peak period takes five percent longer than a trip during the free flow period.⁴⁶

C. *Infrastructure Supply*

⁴³ See Fishman (2009); Brown (2007); Zhang (2007); Buxbaum & Ortiz (2009).

⁴⁴ See, for example, Indiana's House Bill (HB) 1008, passed in 2006, as quoted in Appendix B.

⁴⁵ Because congestion data are at the city level, but an observation in the dataset is at the state level, a mechanism was needed to aggregate city level data to the state level. Two problems arose. First, many states have more than one city listed in the *Urban Mobility Report*. Each state's total TTI was calculated by weighting each city's TTI by the proportion of VMT that city contributed to the total state VMT. Second, some states do not have a city large enough to be included in the *Urban Mobility Report*. For these states we used a conservative estimate of traffic congestion: the average TTI for all small urban areas included in the report, defined as those areas with a population under 500,000 people.

⁴⁶ The actual travel time index is 1.05, but we multiply by 100 to aid interpretation of coefficients.

Another theory argues that governments privatize in response to constraints on traditional sources of financing for public service provision, and are thus forced to turn to the private sector.⁴⁷ Regarding prior work, Bel and Fageda conducted a meta-regression of what drives local government privatization, analyzing four hypotheses most commonly tested in the literature.⁴⁸ One hypothesis focused on fiscal constraints, as many early studies included variables measuring municipal fiscal stress in their regressions. Bel and Fageda found a positive relationship between fiscal constraints and privatization. Although evidence on cost savings from privatization at the local government level is inconclusive, asset monetizations, such as the lease of the Indiana Toll Road, provide states with large upfront payments and remove operations and maintenance from government balance sheets, which generally improve a state's fiscal condition.⁴⁹ Studies indicate that fiscal motivations to be one of the main drivers of privatization through asset sales internationally.⁵⁰ Bel and Fageda found that fiscal constraints do not impact privatization in Europe, but they do influence privatization in the United States.⁵¹

We consider supply-of-funds effects using two variable groups: those measuring a state's general fiscal health, and those measuring a state's alternative sources of infrastructure financing (which we call "traditional finance" variables).⁵² Fiscal health variables include a state's debt outstanding per capita and its bond rating, while traditional finance variables include federal aid

⁴⁷ This theory is broadly consistent with the views of critics of private participation in infrastructure who see private participation as driven by public-sector capital constraints and as a way to disguise government borrowing from such constraints. See, e.g. Roin (2011, p. 1967-8), who refers to private participation in a variety of U.S. economic sectors, and states: "What is not debatable, although, is that many recent privatization deals have been motivated less by the possibility of achieving efficiency advantages than by politicians desire to surreptitiously borrow money . . . Rather than true privatization transactions, it is more accurate to describe these deals as loans repayable out of future governmental revenues."

⁴⁸ Bel and Fageda (2007).

⁴⁹ See e.g. Bel, Fageda, & Warner (2010) for evidence on the lack of cost savings from local government privatization.

⁵⁰ Yarrow 1999; Bortolotti & Milella (2008).

⁵¹ Bel & Fageda (2009).

⁵² We were unable to locate adequate state-level data for our time period that measures the condition of transportation infrastructure. Available measures were incomplete.

for highways per capita, gas tax receipts per capita, and the fraction of a state's total expenditures it uses for highway purposes.⁵³

If a state utilizes the PPP approach in response to poor fiscal conditions, then greater per capita debt will increase the probability and favorability of a PPP law. Similarly, a reduction in the state's bond rating will increase both the probability of law enactment and its favorability. That is, the worse a state's bond rating, the more expensive it will be to use traditional municipal bond financing, and the more likely a state is to use the PPP approach.⁵⁴ One reason to believe that a state will use the PPP approach in response to a poor bond rating is evidenced by Chicago, whose debt was upgraded when it used proceeds from the lease of the Chicago Skyway to pay down existing debt.⁵⁵ We thus predict that both the likelihood of passage and the favorability of PPP legislation will increase as a state's fiscal situation worsens.

D. Political Factors

Bel and Fageda's meta-regression studies of local government privatization consider political interests and ideology to be important factors in the privatization decision. Pressure groups seek to extract rents by either favoring or opposing privatization, and variables measuring unionization rates were found to be common in many studies of local government privatization. In addition, the presence of political interests was an important predictor in many studies they

⁵³ Legislators also cite a lack of traditional finance as a reason the state is considering using PPPs. For example, California's Assembly Bill (AB) 680, passed in 1989, states:

Public sources of revenues to provide an efficient transportation system have not kept pace with California's growing transportation needs, and alternative funding sources should be developed to augment or supplement available public sources of revenue (Stats 1989, Ch. 107, Sec. 1).

⁵⁴ Bond rating data come from Standard and Poor's. A higher numerical value corresponds to a better bond rating. For example, AAA = 21, AA+ = 20, AA = 19, etc.

⁵⁵ Brown (2007).

reviewed.⁵⁶ Although ideology was not an important factor in privatization decisions, it may impact the passage of laws that enable privatization.

McGuire, Ohsfeldt, and Van Cott found that non-monetary constraints, such as unionization and strike activity, are more influential than monetary constraints in the decision to privatize, supporting their hypothesis that bureaucrats act as utility maximizers.⁵⁷ Some studies of voting behavior emphasize the importance of beliefs and ideology⁵⁸, while others have focused on the institutional arrangements of decision-making processes.⁵⁹

Our measures of political factors and political interests are the proportion of Democrats in the state House of Representatives and state unionization rates. We expect the proportion of Democrats to have a negative effect on the passage and favorability of PPP legislation, since conservative parties are associated with pro-business policies, while liberal parties are more associated with public values. If unions (especially public sector unions) oppose PPPs in favor of a traditional approach that is more likely to involve use of union labor, then the union variable will negatively impact both the passage and favorability of PPP enabling legislation.⁶⁰ In addition, if privately operated roadways are more likely to employ electronic tolling, then toll collectors unions will oppose PPP legislation as well.

E. Control Variables

Two of our four basic controls are per capita income and per capita income growth. It is difficult to predict *ex ante* the effect income will have on the likelihood of passing a PPP law and

⁵⁶ Bel and Fageda (2007) and Bel and Fageda (2009).

⁵⁷ McGuire, Ohsfeldt, and Van Cott (1987).

⁵⁸ Poole and Rosenthal (1997).

⁵⁹ See, e.g. North (1990); Dixit (1996), and Irwin and Kroszner (1999).

⁶⁰ Regarding the influence of unions on highway PPPs, one expert notes: “Two different groups of unionized workers may have problems with a private tollway program: state highway department engineers and private sector construction trade unions...State-employed engineers view the design work done by the consortia as work that would otherwise be done in-house...The same approach could be used to frame the issue with construction trade unions.” See Poole (1993, p.15).

on the favorability of that law. Higher income states pay more in taxes and have more money from traditional sources of revenue, suggesting a negative effect. Alternatively, private investors may favor wealthier over poorer states. Investors may then work towards the passage of PPP laws, suggesting a positive effect.⁶¹

We also include as a control the percentage of bordering states that have a law, which measures a possible diffusion effect across states from law passage.⁶² Walker suggests that new policies are partly influenced by developments in other states as a result of both imitation and competition.⁶³ If states are learning from one another and feel more comfortable passing PPP laws if other states have passed them then this variable will positively affect PPP law passage. However, this variable may reduce the probability of the state in question adopting a PPP law (and its favorability) if it observes neighboring states having a negative PPP experience.⁶⁴ The net effect of this variable is thus unclear. We also include the percentage of all states that have a PPP law in the year under observation to measure a general diffusion effect separate from proximity. Finally, we include fixed effects for each of the four census regions and for each year of our sample (1988-2008).⁶⁵

V. Empirical Approach and Estimates

Table 5 reports differences in means between states with PPP laws and states without laws across all of our independent variables. Most differences in means are in the expected direction. For example, states with PPP laws have (on average) higher population growth, higher travel time indices, fewer Democrats in the state house, lower percentages of union membership,

⁶¹ Although we have not conducted extensive analysis of media reports, the only state we are aware of where a PPP law was passed in response to a “deal on the table” was in Indiana in response to the Indiana Toll Road lease.

⁶² If a state has no borders (Hawaii and Alaska), this variable takes on a value of zero.

⁶³ Walker (1969).

⁶⁴ Idaho, for example, has focused on GARVEE bonds rather than PPPs after observing the relative lack of interest in PPPs in large rural states.

⁶⁵ Those regions are the Northeast, West, South and the Midwest. The West is the omitted category.

less federal aid, less money from gas tax receipts, and higher per capita income. We next explore the robustness of these relationships within a regression framework.

(Table 5 here)

A. The Effects of PPP Enabling Laws on Investment

To motivate our empirical analysis of the factors driving PPP legislation, we examine the effects of PPP enabling laws on private investment. We here examine factors explaining the completion of a PPP in a particular year only, leaving a more complete analysis for future work. To measure investment we utilized data on all PPP projects as reported in the U.S. Transportation Projects Scorecard in *Public Works Financing* (September 2011, p. 30). Of the 93 projects listed, 60 are straight design-build (DB) projects, twelve are design-build-finance-operate-maintain (DBFOM), while four are asset leases. We divide our analysis into DB projects only, non-DB projects, and all project types. For each type of project, we examine separately the effect of a PPP act versus the favorability of a PPP law to private investment. We control for a variety of key factors.

Linear probability model estimates of the likelihood of completing a PPP are reported in Table 9 below. As indicated there, both the existence of a PPP enabling law and a more favorable law are associated with a higher probability of PPP completion, with the exception of the PPP act indicator for non-DB projects. Regarding magnitudes, the existence of a PPP enabling law increases the probability of completing a DB PPP by about 6.6 percent, and the probability of completing a PPP of any type by about 8 percent. The favorability of a PPP law to private investment also has an important effect on the likelihood of PPP completion. In addition to being statistically significant, a unit change in the favorability index increases the probability of completing a DB PPP by about 12 percent and a non-DB project by about 9 percent.

Growth in vehicle registrations and greater traffic congestion as reflected in the travel time index increase the probability of completing both a DB project and a project of any type, while a higher fraction of democrats in the state house reduces those probabilities. Regarding a state's fiscal health, a better bond rating reduces the probability of completing a PPP in a particular year, but in a non-linear fashion.

Future analysis will include consideration of specific components of state PPP enabling laws to ascertain which aspects of those laws are most important in attracting private investment. It will also consider the effects of PPP enabling laws and their favorability on the amount of private investment. The estimates reported in Table 9 are however overall supportive of PPP enabling laws significantly impacting private infrastructure investment.

B. Determinants of the Passage of PPP Legislation

We first estimate the effects of our independent variables on the probability that a state has passed a PPP law in a given year. We use the following empirical specification, where for any state i in year t :

$$(1) \quad \hat{y}_{it} = \alpha + \mathbf{X}_{it} \boldsymbol{\beta} + v_i + \varepsilon_{it} \quad i = 1, \dots, 50; t = 1988, 1989 \dots 2008$$

$$y_{it} = 1 \quad \text{if} \quad \hat{y}_{it} > 0$$

$$= 0 \quad \text{if} \quad \hat{y}_{it} \leq 0$$

where \hat{y}_{it} equals the unobserved legal response variable for state i in year t , y_{it} is the observed state law variable which equals 1 if the state has a PPP law in year t (and zero if not), \mathbf{X}_{it} is a row vector of exogenous variables including a constant, $\boldsymbol{\beta}$ is a column vector of unknown coefficients, v_i is a region-specific fixed-effect, ε_{it} is a state-specific error term. We use a logit model to estimate equation 1. All 50 states are included in the initial sample. Because

observations within a state are correlated across time, we cluster standard errors at the state level in all specifications.

Table 6 reports logistic regression estimates using four different specifications. The first contains controls, demand variables, and fiscal health variables only. The second specification adds political variables and traditional finance variables. The third adds regional dummies, and the fourth and final specification adds year dummies (with available data and observations falling as variables are added).⁶⁶ In the final specification, when all variables and dummies are included, two demand variables are important in predicting the passage of enabling legislation. Motor vehicle ownership as reflected in registration growth has a positive and significant impact on the passage of enabling legislation, as does the travel time index (TTI), a measure of congestion. The marginal effect of TTI indicates that a one-percent increase in the travel time index in the peak period relative to free-flow leads to about a 2.3 percent increase in the probability of adopting a PPP law. This estimate is robust to all four specifications, and to the substitution of other measures of congestion, such as annual hours of delay per peak period traveler.

Private investment may be seen as a solution to a state's congestion problems for several reasons. States may view PPPs as a way to alleviate congestion on existing routes.⁶⁷ In addition,

⁶⁶ We include regional dummies because policies toward tolling and public toll authorities, and thus PPPs, vary widely by region. The northeast, for example, has a long history of public toll roads and turnpikes. Examples (and dates opened to traffic) include: the Pennsylvania Turnpike (1940), Maine Turnpike (1947), New Jersey Turnpike (1952), New York State Thruway (1954), Mass Pike (1957), and the Connecticut Turnpike (1958; tolls removed in 1988). All are part of the Interstate System. There are likely to be time-invariant, unobservable characteristics of regions such as the northeast that may affect act adoption. Figure 1 also reveals strong regional effects in act adoption.

⁶⁷ Research indicates, however, that the construction of new roads and lanes does not reduce traffic congestion in the long run. Duranton and Turner (forthcoming) show that a 10 percent increase in Interstate mileage in 2000 led to a 10 percent increase in annual vehicle miles by the end of the decade. They conclude that "increased provision of roads or public transit is unlikely to relieve congestion." See Duranton and Turner, "The Fundamental Law of Road Congestion: Evidence from U.S. Cities," *American Economic Review* (forthcoming). Congestion relief nevertheless continues to be an important argument for the expansion of transportation capacity. See e.g., the majority report in

PPPs are more likely to utilize automated tolling technology, and congestion pricing relative to tax financed and publicly provided transport infrastructure.⁶⁸ An alternative hypothesis is that the most congested areas present the greatest profit opportunities to the private sector, and that private companies urge the government to adopt legislation where they see solid business prospects. Second, states can use PPPs to add new capacity to alleviate congestion on existing routes, as is being done with construction of the Port of Miami Tunnel.⁶⁹

(Table 6 here)

The two political variables are important in determining whether or not a state adopts PPP enabling legislation. The variable measuring the composition of the state House of Representatives displays a negative and significant effect.⁷⁰ This is consistent with the view that Republicans are more likely than Democrats to favor privatization.⁷¹ Higher unionization rates negatively impact the adoption of PPP enabling legislation in the second specification only.⁷² The coefficient on the bond rating variable in the first and second specifications suggest that states with better bond ratings are less likely to adopt PPP legislation, which implies that access to low-cost capital in the municipal bond markets is a substitute to private investment. The significance of this estimate is not robust to the inclusion of region fixed effects, however. Other measures of fiscal constraints and traditional finance are not significant predictors of act passage.

Transportation for Tomorrow: The Final Report of the National Surface Transportation Policy and Revenue Study Commission (2008).

⁶⁸ See Geddes (2011).

⁶⁹ On the Port of Miami Tunnel PPP project see: <http://www.portofmiamitunnel.com/project-overview/project-overview-1/> (accessed July 18, 2011).

⁷⁰ Nebraska drops out of the sample when political variables are included because of the unicameral nature of their legislature. However, Nebraska only had three observations because of missing state bond rating data.

⁷¹ A recent newspaper article about the passage of PPP legislation in Ohio helps substantiate this. The author writes, "Partnerships were not a part of the bill when the House voted on it the first time. Rep. Ron Amstutz, R-Wooster, chairman of the House Finance Committee, said the inclusion of public-private partnerships by the Senate caused House Democrats to vote against the bill." See J. Vardon, "New transportation bill has public-private option," *The Columbus Dispatch*, March 31, 2011.

⁷² In an example of union opposition to a PPP, state highway engineers in California recently filed a lawsuit in an attempt to stop the Presidio Parkway in San Francisco. See J. Dugan, "In California, A Road to Recovery Stirs Unrest," *The Wall Street Journal*, December 1, 2010.

Overall, Table 6 provides very limited support for the view that states are adopting PPP enabling laws because fiscal constraints, but does suggest that they are responding to motorists' demand. Finally, the passage of laws by other states over time is positively related to PPP law passage.

Although we do not report estimates for the three regional dummies (with the West omitted) in specifications 3 and 4, it is notable that those estimates accord with the Figure 1. Relative to the West, the Northeast is significantly less likely to pass an enabling law, as is the Midwest. Interestingly, the South is significantly more likely to pass an enabling law relative to the West.

C. Determinants of the Favorability of PPP Legislation to Private Investment

We next model the effect of our variables on the favorability of PPP enabling legislation to private investment using a linear regression model with panel-corrected standard errors.⁷³ To reduce the variation across states with laws and states without laws and to focus more on variation in favorability, we performed estimates using two reduced samples. The first sample consists of all states that passed a law between 1988 and 2008, and the second drops all observations where the state has not yet passed a law. The first reduced sample contains zeroes for those states that have not yet passed a law, but pass at some point during the period. The second sample drops all observations that have a favorability index value of zero.⁷⁴

The first three columns of Table 7 report estimates using the first reduced sample. We here hope to sharpen the analysis by excluding states that have never passed a PPP enabling law, as there may be systematic unobservable differences between states that have passed laws versus

⁷³ See Beck and Katz (1995) who suggest that OLS parameter estimates with panel-corrected standard errors produce accurate estimates even in the presence of complex panel error structures. The model corrects for correlation in the errors over time as well as for contemporaneous correlation across panels at a single point in time.

⁷⁴ The first reduced sample (states that passed laws) contains between 546 and 507 observations, depending on the specification, while the second sample (states with positive favorability index values) contains between 291 and 274 observations, depending on the specification. See Appendix A for summary statistics for reduced samples.

those that have not. The specifications are the same as in columns 2 through 4 of the logit models.

Demand variables, in particular VMT growth and congestion, positively affect PPP enabling law favorability. In addition, both political variables negatively impact the favorability of PPP legislation, as they did the passage of PPP legislation. Federal highway aid per capita, which was not significant in any of the full-sample logit specifications, is in this sample negatively associated with the favorability of PPP laws, even when region and year fixed effects are included. This suggests that federal aid may be a substitute for private participation, although this finding is not robust to our smaller sample of positive favorability values only.

(Table 7 here)

Two variables impacting favorability that did not affect passage are per capita income and per capita income growth. Both have the anticipated positive effect. These variables confirm the finding that wealthier and higher-growth states are more encouraging of private investment, perhaps because private investors prefer to invest in wealthier states.

Columns four, five, and six of Table 7 report estimates from the second reduced sample, which includes observations with positive favorability index values only. Estimates using these specifications share similarities to those from the previous sample. Among the demand variables, only the travel-time index is robust to the inclusion of region and year fixed effects in both samples. In specification 3 using the second reduced sample, a one percent increase in the travel-time index increases the favorability index by 3.2 percent.

The state Democrat variable is again negative and significant. Democrats in the state house reduce the favorability of PPP enabling legislation to private investment. Specifically, a

one percent increase in the state house Democrats reduces the favorability of the law by about 3.4 percent.

Similar to the logit models, the union variable loses its significance when region fixed effects are added to the model in both samples. The level and growth of per-capita income variables, however, remain positive and significant, suggesting that faster growing and wealthier states have legislation that is more favorable to the private sector.

We do not report estimates for the three regional dummies (with the West omitted) in specifications 3 for both samples in Table 7. However, these estimates accord well with expectations based on Figure 1 and on the history of toll authorities in the Northeast. Relative to the West, PPP enabling laws in the Northeast are less favorable to private investment, resulting in a 1.5-point reduction in our ten-point scale when using the smallest sample. Enabling laws in the Midwest are similarly less favorable, by a 0.67-point reduction in our ten point scale. Relative to the West, PPP enabling laws in the South are more favorable by a 0.84 increase in the scale.

D. Cox Proportional Hazard Analysis of the Passage of PPP Enabling Laws

We next use hazard, or survival, analysis to examine the effect of a variety of independent variables on a State's time-to-adoption of a PPP enabling law.⁷⁵ To provide some background, let T represent the time it takes (in years) for a State to adopt a PPP enabling law. T is a random variable with cumulative distribution function $P(t) = Pr(T \leq t)$. Its probability density function is $p(t) = dP(t)/dt$. The complement of the distribution function is the survival function $S(t)$, where $S(t) = Pr(T > t) = 1 - P(t)$.

⁷⁵ See, e.g. Geddes and Vinod (2002), Greene (1997), Keifer (1988), and Lancaster (1990). Hazard analysis has become standard in studies of legal change, including of branch-banking deregulation (Kroszner and Strahan 1999), fair employment laws (Collins 2003), and the adoption of concealed-carry handgun laws (Grossman and Lee, 2008), among others. Also see Fox (2002) from which this discussion borrows.

Another representation of the distribution of survival times is the hazard function, $h(t)$. In this case, the hazard function represents the instantaneous “risk” that a State will adopt a PPP enabling law at time t , conditional on the fact that it has not reformed up to that time. In general, $h(t)$ is given by:

$$h(t) = \lim_{\Delta t \rightarrow 0} \Pr [(t \leq T < t + \Delta t) | T \geq t] / \Delta t$$

$$= f(t) / S(t)$$

We use a Cox proportional hazard model to estimate a State’s time-to-adoption.⁷⁶ The Cox model is very general, and in our context assumes that:⁷⁷

$$h_i(t) = h_0(t) \exp(\beta_1 x_{i1} + \beta_2 x_{i2} + \dots + \beta_k x_{ik})$$

where $h_i(t)$ is the hazard rate for State i at time t and $h_0(t)$ is the baseline hazard function. One appealing aspect of the Cox model is that it leaves the baseline hazard function $\alpha(t) = \log h_0(t)$ unspecified, which enhances its flexibility. The x ’s are the covariates, which enter into the model in a linear fashion.⁷⁸

Our covariates are time-varying and are measured annually from 1988 to 2008. Durations for some States are thus right-hand side censored, which we allow for in our estimates. We report the results of our Cox hazard estimation in Table 8 below. As shown there, three variables are consistently significant: the travel time index, percent of state house that is democratic, and the percent of neighboring states that have adopted a PPP enabling law. This is broadly consistent with the findings in Table 7 except that neither per capita income nor per capita income growth are significant in hazard estimates.

⁷⁶ The Cox proportional hazard model is the most widely used method in survival analysis. See Fox (2002) from which this discussion borrows.

⁷⁷ See e.g. Grossman and Lee (2008, p. 203). Possible specific distributional assumptions include the Weibull and the exponential.

⁷⁸ The Cox model is thus semi-parametric.

VII. Summary and Conclusions

Numerous U.S. states and localities are facing serious challenges in financing, maintaining and renovating critical transportation infrastructure. Even though many highways and bridges are old and past their original design lives, they are used more intensively over time. At the same time, states and localities are facing severe budgetary shortfalls. More states are expanding the role of private investors and private facility operators through the use of public-private partnerships.

One tool used to encourage private participation is state-level PPP enabling legislation. Thirty states had passed modern PPP enabling laws as of late 2011. Those laws provide the institutional structure for PPPs by clarifying such issues as the mixing of public and private financing, whether PPPs can be used on both new and existing facilities, whether or not the government can share toll revenue, and whether or not the approval of the state's legislature is needed after the PPP agreement is concluded.

We surveyed PPP experts from a range of backgrounds, which allows us to attach weights to thirteen key elements of PPP enabling laws. We then thoroughly examined state laws to see which laws contained which provisions. This allowed us to generate an index of favorability to private investment. More states are passing PPP enabling laws over time. The favorability of the average PPP enabling law is also rising over time.

We focused on what drives states to pass PPP enabling laws, and why some states pass laws that are relatively more enabling of private investment. We use logistic regression to examine the key drivers of a state's decision to pass a PPP enabling law. In addition to the proportion of other states that have passed laws, we find that growth in vehicle registrations, traffic congestion, and a state's political disposition, affect the probability of passage in

predictable ways, and are robust to the inclusion of year and region fixed effects. Rising vehicle registrations and traffic congestion both increase the likelihood of passage. A greater share of Democrats in the state house reduces the likelihood significantly. We find little evidence that a state's fiscal constraints, as measured by several measures of fiscal health and sources of traditional financing, are an important driver in the decision to pass a PPP enabling law.

Relying on our favorability index, we use linear regression with panel-corrected standard errors to examine a law's favorability to private investment. In our most restrictive sample using only those states and years exhibiting positive index values, we find that traffic congestion improves favorability to investment, while the share of Democrats in the state house reduces it. With the exception of federal highway aid in our first reduced sample (an effect robust to the inclusion of region and year fixed effects), we find little evidence that fiscal constraints affect favorability. In contrast to our logistic estimates, we find that both the level and growth rate in a state's per capita income improve a law's favorability to private investment. Overall, our findings are supportive of the view that PPP laws and their favorability are driven largely by demand and political affiliation, but are not supportive of the view that fiscal exigencies are forcing states to adopt PPP enabling laws.

Table 1 - Survey-Weighted Enabling Scores for Key Provisions of PPP Laws

<i>Provision</i>	<i>Survey-weighted enabling score</i>
1a. The law allows multiple modes of transportation and types of transportation facilities to be eligible for a PPP.	0.9
1b. Roads and highways are not eligible for PPPs under the statute.	0.08
2. The law allows existing transportation facilities, as well as new transportation facilities, to be PPP-eligible.	0.88
3. The law allows the responsible public entity to receive both solicited and unsolicited proposals.	0.77
4. The statute exempts PPPs from the state's procurement laws.	0.8
5a. The law explicitly permits revenue sharing in PPP agreements.	0.8
5b. The law does not allow revenue sharing in PPP agreements.	0.21
6. The law explicitly permits the state to make payments to the private entity in lieu of direct user fees (e.g. availability payments).	0.91
7. The law explicitly grants authority to entities other than the primary public sponsor (i.e. counties, municipalities) to enter into PPP agreements.	0.83
8. The law exempts the private entity from paying property taxes on the land required to operate the facility.	0.73
9a. The law explicitly allows PPP agreements to contain non-compete clauses or compensation clauses.	0.78
9b. The law explicitly prohibits the PPP agreement from containing non-compete clauses or requires the state to maintain a free, alternative route.	0.27
10a. The law allows both public and private sector money to be combined in the financing of a PPP project.	0.95
10b. The law requires the private sector to put up all of the financing for a PPP project (i.e. no public sector funds allowed).	0.18
11. The law protects the confidentiality of proprietary information contained in a private entity's proposal.	0.89
12a. The law includes a provision that allows the state legislature (or another public body) to reject a PPP agreement.	0.05
12b. The law does not include a provision that allows the state legislature (or another public body) to reject a PPP agreement.	0.88
13a. The law puts a limit on the number of projects that can be developed under the PPP approach.	0.23
13b. The law does not put a limit on the number of projects that can be developed under the PPP approach.	0.89

Note: The survey-weighted enabling score was created by asking PPP experts to weight each provision on a five-point Likert Scale from zero (“very discouraging”) to four (very encouraging”) and then normalizing the scale to be between zero and one.

Table 2 - Maximum Possible Favorability Index Values

	The maximum possible score...	
	For a single provision	For a state
Based on hypothetical of all survey respondents responding "very encouraging"	1	10
Based on actual survey responses	0.95	8.5

Table 3 - Descriptive and Summary Statistics

Variable	Minimum	Maximum	Mean	Standard Deviation	No. Obs.
PPP_ACT (=1 if state has PPP enabling law)	0	1	0.2771	0.4478	1050
PPP_INDEX (survey-weighted favorability index)	0	7.515	0.949	1.763	1050
Per capita income (2008 dollars, hundreds)	115.61	562.48	261.6	76.54	1050
Per capita income growth (%)	-9.58	33.19	4.5	2.36	1050
Population growth (%)	-5.6	7.82	1.06	1.02	1050
Motor vehicle registration growth (%)	-53.74	28.28	1.57	4.52	1050
Vehicle-miles traveled growth (%)	-14.14	41.2	2.16	2.99	1050
Travel Time Index ^A	102	135	113	7.38	1050
State debt outstanding per capita (2000 dollars, hundreds)	1.66	165.01	23.53	17.36	1050
State bond rating ^B	13	21	19.2	1.35	948
Democrats in state House of Representatives (%)	13	95	54.03	16.26	1029
Union membership (%)	2.3	30.5	12.98	5.98	1050
Federal-aid for highways per capita (2000 dollars)	0.22	542.78	113.03	76.15	1050
State gas tax receipts per capita (2000 dollars)	29.78	216.62	121.07	30.48	1050
State highway expenditures as a percent of total expenditures (%)	2.69	17.91	8.3	2.68	1050

Notes: All growth variables are year-over-year. See Appendix for a full list of data sources.

^A The travel time index is a congestion measure calculated by the *Texas Transportation Institute*. For example, a value of 105 indicates that a trip during the "peak" period takes 5 percent longer than a trip during the "free-flow" period.

^B Bond rating data come from Standard and Poor's. A higher value corresponds to a better (i.e. less risky) bond rating. For example, AAA = 21, AA+ = 20, AA = 19, etc.

Table 4 - Dates of First Passage of PPP Laws and 2008 Favorability Scores

State	First Passed	Enabling Index	Rank	State	First Passed	Enabling Index	Rank
AK	2006	1.6	22	MT	---	---	---
AL	1996	3.3	17	NE	---	---	---
AZ	1991	3	18	NV	2003	2.8	21
AR	---	---	---	NH	---	---	---
CA	1989	3.9	15	NJ ^C	1997	---	---
CO	1995	6.5	4	NM	---	---	---
CT	---	---	---	NY	---	---	---
DE	1995	5.9	8	NC	2000	4.2	13
FL	1991	6.2	5	ND	---	---	---
GA	1998	6	7	OH ^D	---	---	---
HI	---	---	---	OK	---	---	---
ID	---	---	---	OR	1995	6.1	6
IL ^A	---	---	---	PA	---	---	---
IN	2006	4.6	11	RI	---	---	---
IA	---	---	---	SC	1994	1.4	24
KS	---	---	---	SD	---	---	---
KY	---	---	---	TN	2007	1.6	23
LA	1997	6.6	3	TX	1991	7.5	1
ME ^B	---	---	---	UT	1997	5.2	9
MD	1997	3.4	16	VT	---	---	---
MA ^A	---	---	---	VA	1988	7.2	2
MI	---	---	---	WA	1993	2.8	20
MN	1993	2.8	19	WV	2008	4	14
MS	2007	4.8	10	WI	1997	1.4	24
MO	2006	4.2	12	WY	---	---	---

Notes: Dash indicates that no law was ever passed. Source: Author's compilation.

^A Passed PPP statute in 2009 ^B Passed statute in 2010 ^C Law expired in 2003 ^D Passed statute in 2011

**Table 5 - Differences in Means of Explanatory Variables, by PPP Act
1988-2008**

Variable	Mean (S.D.)		Difference [t-stat]
	<i>Act = 1</i>	<i>Act = 0</i>	
Personal income (2008 dollars, in hundreds)	297.66 (63.91)	247.77 (76.5)	49.89 [9.88]**
Personal income growth (%)	4.21 (2.69)	4.6 (2.2)	-0.39 [2.45]**
Population growth (%)	1.5 (0.93)	0.88 (0.99)	0.61 [9.07]**
Motor vehicle registration growth (%)	1.99 (5.32)	1.41 (4.16)	0.58 [1.88]*
Vehicle-miles traveled growth (%)	1.82 (2.47)	2.28 (3.15)	-0.45 [2.20]**
Travel time index	120.05 (7.18)	111.51 (5.94)	8.53 [19.62]**
Debt per capita (2000 dollars, in hundreds)	18.8 (11.47)	25.33 (18.83)	-6.53 [5.53]**
State bond rating	19.56 (1.51)	19.05 (1.24)	0.5 [5.34]**
Democrats in state House of Representatives (%)	49.75 (11.93)	55.71 (17.4)	-5.95 [5.36]**
Union membership (%)	10.84 (5.57)	13.79 (5.92)	-2.95 [7.35]**
Federal-aid for highways per capita (2000 dollars)	88.49 (47.72)	122.42 (82.66)	-33.92 [6.59]**
State gas tax receipts per capita (2000 dollars)	112.41 (23.76)	124.39 (32.08)	-11.98 [5.79]**
State highway expenditures as a percent of total expenditures (%)	7.3 (1.94)	8.68 (2.81)	-1.38 [7.69]**

Notes: standard errors are in parentheses. T-statistics are in brackets. All variables except state bond ratings and percent Dems in state House have 759 observations for states without PPP laws and 291 observations for states with PPP laws; the bond rating variable has 674 observations and 274 observations, respectively; and the percent Dems in state House variable has 738 observations and 291 observations, respectively.

** Significant at 5 percent level

**Table 6 - Logit Estimates of the Probability of Adoption of PPP
Enabling Laws**

Dependent Variable equals 1 if PPP law passed in observation year, zero otherwise

Variable	Specification			
	(1)	(2)	(3)	(4)
<i>Demand</i>				
Pop growth	0.387 (0.402)	0.219 (0.306)	0.091 (0.322)	-0.023 (0.342)
Registration growth	0.019 (0.029)	0.034 (0.025)	0.031* (0.018)	0.036* (0.019)
VMT growth	-0.047 (0.034)	-0.064* (0.038)	-0.059 (0.038)	-0.001 (0.049)
Travel Time Index	0.177** (0.046)	0.234** (0.048)	0.323** (0.058)	0.378** (0.072)
	[0.025]	[0.029]	[0.023]	[0.023]
<i>Fiscal Health</i>				
Debt per capita	-0.006 (0.035)	0.012 (0.035)	0.029 (0.027)	0.039 (0.031)
Bonds	-5.627** (1.801)	-3.773* (2.178)	-3.437 (3.204)	-2.066 (3.527)
Bonds-squared	0.157** (0.051)	0.105* (0.060)	0.093 (0.087)	0.055 (0.096)
<i>Political</i>				
Dems in House		-0.053** (0.023)	-0.118** (0.027)	-0.140** (0.032)
		[-0.007]	[-0.008]	[-0.008]
Union membership		-0.161** (0.067)	0.002 (0.078)	-0.028 (0.087)
<i>Traditional Finance</i>				
Federal aid per capita		-0.001 (0.009)	-0.002 (0.005)	-0.001 (0.007)
Gas tax receipts per capita		0.002 (0.016)	0.006 (0.013)	0.009 (0.015)
Pct. highway expenditures		-0.255 (0.180)	-0.280 (0.200)	-0.347 (0.226)
<i>Controls</i>				
Per capita income	-0.009 (0.008)	-0.009 (0.008)	-0.006 (0.007)	-0.007 (0.009)
Per capita income growth	0.014 (0.042)	0.004 (0.037)	-0.026 (0.049)	-0.017 (0.070)
Pct. states with laws	0.087** (0.032)	0.047 (0.037)	0.083* (0.045)	0.125* (0.071)
Neighbors	0.015 (0.011)	0.010 (0.011)	-0.015 (0.012)	-0.017 (0.012)
<i>Intercept</i>	27.688* (16.627)	12.193 (19.296)	-4.574 (31.425)	-22.612 (34.440)
<i>Regional fixed effects</i>	No	No	Yes	Yes
<i>Year fixed effects</i>	No	No	No	Yes
<i>Goodness-of-fit</i>				
No. Observations	948	945	945	945
Pseudo R-squared	0.397	0.462	0.593	0.612
Log-likelihood	-343.6	-306.1	-231.7	-220.5
Wald (Chi-squared)	108.0	129.0	196.9	5741

Note: standard errors are in parentheses. Marginal effects are in brackets.

** Significant at 5 percent level

* Significant at 10 percent level

Table 7 - Linear Regression with Panel Corrected Standard Errors: Estimates of the Favorability of PPP Enabling Laws
 Dependent variable is survey-weighted favorability index

Specification	Sample					
	<i>States that passed laws between 1988-2008</i>			<i>States with positive index values only</i>		
	(1)	(2)	(3)	(1)	(2)	(3)
<i>Demand</i>						
Pop growth	-0.005 (0.052)	-0.018 (0.053)	-0.012 (0.065)	-0.044 (0.082)	-0.055 (0.090)	-0.039 (0.090)
Registration growth	-0.003 (0.005)	-0.002 (0.005)	-0.001 (0.005)	-0.009* (0.005)	-0.009 (0.006)	-0.008 (0.006)
VMT growth	0.018* (0.011)	0.018 (0.011)	0.023* (0.012)	0.006 (0.014)	0.007 (0.015)	0.015 (0.016)
Travel Time Index	0.028* (0.016)	0.037** (0.014)	0.062** (0.018)	0.016 (0.015)	0.021 (0.013)	0.032* (0.016)
<i>Fiscal Health</i>						
Debt per capita	0.003 (0.007)	0.002 (0.007)	0.003 (0.007)	-0.005 (0.012)	-0.011 (0.011)	-0.008 (0.012)
Bonds	-0.022 (0.546)	-0.032 (0.563)	0.255 (0.573)	0.339 (0.419)	0.470 (0.487)	0.591 (0.520)
Bonds-squared	-0.000 (0.015)	0.000 (0.016)	-0.009 (0.016)	-0.010 (0.012)	-0.015 (0.014)	-0.018 (0.015)
<i>Political</i>						
Dems in House	-0.011* (0.006)	-0.021** (0.007)	-0.028** (0.008)	-0.017** (0.006)	-0.031** (0.007)	-0.034** (0.009)
Union membership	-0.055** (0.025)	-0.012 (0.029)	-0.032 (0.030)	-0.060** (0.026)	0.007 (0.035)	-0.018 (0.035)
<i>Traditional Finance</i>						
Federal aid per capita	-0.002 (0.001)	-0.004** (0.002)	-0.003* (0.002)	-0.001 (0.002)	-0.003 (0.002)	-0.002 (0.002)
Gas tax receipts per capita	-0.000 (0.003)	-0.003 (0.003)	-0.001 (0.003)	0.000 (0.004)	-0.000 (0.004)	0.001 (0.004)
Pct. highway expenditures	0.036 (0.039)	0.036 (0.038)	0.024 (0.039)	0.053 (0.053)	0.048 (0.050)	0.045 (0.052)
<i>Controls</i>						
Per capita income	0.005* (0.003)	0.008** (0.003)	0.008* (0.004)	0.008** (0.003)	0.010** (0.003)	0.011** (0.003)
Per capita income growth	0.029** (0.012)	0.025** (0.013)	0.039** (0.016)	0.030* (0.015)	0.024 (0.016)	0.036** (0.018)
Pct. states with laws	0.062** (0.012)	0.055** (0.012)	-0.157 (0.111)	0.026** (0.012)	0.030** (0.012)	-0.144 (0.110)
Neighbors	-0.004 (0.004)	-0.008** (0.004)	-0.007* (0.004)	-0.005** (0.002)	-0.010** (0.003)	-0.008** (0.003)
Intercept	-2.601 (5.044)	-6.313 (5.481)	0.000 (0.000)	-2.936 (4.058)	-6.596 (5.034)	0.000 (0.000)
<i>Regional fixed effects</i>	No	Yes	Yes	No	Yes	Yes
<i>Year fixed effects</i>	No	No	Yes	No	No	Yes
<i>Goodness-of-fit</i>						
Observations	507	507	507	274	274	274
Panels	0.202	0.283	0.324	0.314	0.355	0.391
R-squared	26	26	26	26	26	26

Note: standard errors are in parentheses.

** Significant at 5 percent level

* Significant at 10 percent level

Table 8. Cox Proportional Hazard Estimates of the Passage of State PPP Enabling Laws

<i>VARIABLE</i>	(1) _t	(2) _t	(3) _t	(4) _t
<i>Per capita income</i>	-0.007 (0.008)	-0.022 (0.014)	-0.023 (0.015)	-0.025 (0.016)
<i>Per capita income growth</i>	-0.087 (0.176)	-0.039 (0.197)	-0.025 (0.193)	0.004 (0.188)
<i>Neighbors</i>	-0.025** (0.013)	-0.027* (0.014)	-0.032** (0.016)	-0.033** (0.017)
<i>Population Growth</i>	0.399 (0.248)	0.477* (0.278)	0.275 (0.296)	0.346 (0.337)
<i>Vehicle Registration Growth</i>	0.069 (0.059)	0.063 (0.069)	0.059 (0.062)	0.063 (0.063)
<i>VMT per capita</i>	-0.000 (0.013)	-0.018 (0.023)	-0.021 (0.029)	-0.030 (0.028)
<i>VMT per capita Growth</i>	-0.080 (0.061)	-0.058 (0.076)	-0.000 (0.086)	-0.003 (0.086)
<i>Travel Time Index</i>	0.147** (0.045)	0.176** (0.060)	0.250** (0.073)	0.270** (0.084)
<i>Debt per capita</i>	-----	0.022 (0.019)	0.021 (0.021)	0.013 (0.020)
<i>Bond rating</i>	-----	-0.579 (2.334)	-1.460 (2.950)	-0.548 (3.134)
<i>(Bond rating)²</i>	-----	0.024 (0.063)	0.043 (0.080)	0.020 (0.085)
<i>Democrats in Statehouse</i>	-----	-----	-0.069** (0.017)	-0.079** (0.021)
<i>Union Membership</i>	-----	-----	0.062 (0.079)	0.053 (0.077)
<i>Federal Aid per capita</i>	-----	-----	-----	0.007 (0.006)
<i>Gas tax per</i>	-----	-----	-----	0.008 (0.008)
<i>Highway Expenditure per capita</i>	-----	-----	-----	-0.223 (0.184)
<i>Northeast</i>	-1.841 (1.352)	-1.244 (1.471)	-1.070 (1.198)	-0.604 (1.511)
<i>Midwest</i>	-0.490 (0.713)	0.006 (0.894)	-0.330 (0.922)	0.355 (1.279)
<i>South</i>	1.204* (0.651)	1.726* (0.900)	3.026** (1.079)	3.815** (1.570)
<i>Observations</i>	729	649	646	646

Robust standard errors in parentheses

** $p < 0.05$, * $p < 0.10$

Table 9. Panel A: Linear Probability Estimates of the Effects of PPP Enabling Laws on the Likelihood of PPP Completion (DB Projects only)

<i>Specification</i>	DB			
	1		2	
PPPAct	0.0658***	(0.0213)		
PPPIndex			0.117**	(0.0526)
<i>Demand</i>				
Pop growth	0.0033	(0.0098)	0.0033	(0.0098)
Registration growth	0.0053***	(0.0016)	0.0056***	(0.0016)
VMT growth	0.0008	(0.0026)	0.0008	(0.0026)
Travel Time Index	0.0038**	(0.0017)	0.0046***	(0.0017)
<i>Fiscal Health</i>				
Debt per Capita	0.0003	(0.0007)	0.0003	(0.0007)
Bonds	0.0569	(0.0821)	0.0711	(0.0820)
Bonds-squared	0.0017	(0.0022)	0.0020	(0.0022)
<i>Political</i>				
Democrats voting for President	0.0005	(0.0015)	0.0006	(0.0015)
			-	
Dems in House	0.0011	(0.0007)	0.0013349**	(0.0007)
Union membership	0.0006	(0.0020)	0.0008	(0.0020)
<i>Traditional Finance</i>				
Federal aid per capita	0.0001	(0.0002)	0.0001	(0.0002)
Pct. Highway expenditures	0.0037	(0.0042)	0.0053	(0.0042)
<i>Controls</i>				
Per capita income	0.0000	(0.0003)	0.0000	0.0003
Per capita income growth	0.0029	(0.0037)	0.0032	(0.0037)
<i>Intercept</i>	0.1519	(0.7895)	0.2326	(0.7916)
<i>Regional fixed effects</i>	Yes		Yes	
<i>Year fixed effects</i>	Yes		Yes	
<i>Goodness-of-fit</i>				
Observations	945		945	
R-Squared	0.1235000		0.1190000	

Table 9. Panel B: Linear Probability Estimates of the Effects of PPP Enabling Laws on the Likelihood of PPP Completion (Non-DB Projects Only)

	Non - DB			
<i>Specification</i>	1		2	
PPPAct	0.0177	(0.0134)		
PPPIndex			0.091***	(0.0328)
<i>Demand</i>				
Pop growth	0.0040	(0.0062)	0.0038	(0.0061)
Registration growth	0.0001	(0.0010)	0.0000	(0.0010)
VMT growth	0.0015	(0.0017)	0.0014	(0.0016)
Travel Time Index	0.0004	(0.0011)	0.0002	(0.0010)
<i>Fiscal Health</i>				
Debt per Capita	0.0000	(0.0004)	0.0000	(0.0004)
Bonds	-0.136***	(0.0515)	-0.135***	(0.0512)
Bonds-squared	0.0034***	(0.0014)	0.0035***	(0.0014)
<i>Political</i>				
Democrats voting for President	0.0006	(0.0010)	0.0005	(0.0010)
Dems in House	0.0005	(0.0004)	0.0003	(0.0004)
Union membership	0.0014	(0.0012)	0.0013	(0.0012)
<i>Traditional Finance</i>				
Federal aid per capita	0.0001	(0.0001)	0.0001	(0.0001)
Pct. Highway expenditures	0.0018	(0.0027)	0.0016	(0.0026)
<i>Controls</i>				
Per capita income	0.0003	(0.0002)	0.0002	(0.0002)
Per capita income growth	0.0012	(0.0023)	0.0013	(0.0023)
<i>Intercept</i>	1.2554	(0.4958)	1.2968	(0.4942)
<i>Regional fixed effects</i>	Yes		Yes	
<i>Year fixed effects</i>	Yes		Yes	
<i>Goodness-of-fit</i>				
Observations	945		945	
R-Squared	0.0581000		0.0643000	

Table 9. Panel C: Linear Probability Estimates of the Effects of PPP Enabling Laws on the Likelihood of PPP Completion (All PPP Projects)

<i>Specification</i>	All			
	1		2	
PPPAct	0.0803***	(0.0240)		
PPPIndex			0.191***	(0.0592)
<i>Demand</i>				
Pop growth	0.0092	(0.0011)	0.0090	(0.0111)
Registration growth	0.0053***	(0.0018)	0.0056***	(0.0018)
VMT growth	0.0003	(0.0030)	0.0003	(0.0030)
Travel Time Index	0.0043**	(0.0019)	0.0046***	(0.0019)
<i>Fiscal Health</i>				
Debt per Capita	0.0003	(0.0007)	0.0003	(0.0007)
Bonds	-0.201**	(0.0925)	-0.215***	(0.0923)
Bonds-squared	0.0054**	(0.0025)	0.0058**	(0.0025)
<i>Political</i>				
Democrats voting for President	0.0012	(0.0017)	0.0012	(0.0017)
Dems in House	-0.0014*	(0.0008)	-0.0015*	(0.0008)
Union membership	0.0017	(0.0220)	0.0018	(0.0022)
<i>Traditional Finance</i>				
Federal aid per capita	0.0000	(0.0002)	0.0000	(0.0002)
Pct. Highway expenditures	0.0005	(0.0048)	0.0023	(0.0047)
<i>Controls</i>				
Per capita income	0.0003	(0.0003)	0.0002	(0.0003)
Per capita income growth	0.0045	(0.0042)	0.0002	(0.0042)
<i>Intercept</i>	1.4574	(0.8897)	1.5721	(0.8902)
<i>Regional fixed effects</i>	Yes		Yes	
<i>Year fixed effects</i>	Yes		Yes	
<i>Goodness-of-fit</i>				
Observations	945		945	
R-Squared	0.1375000		0.1368000	

Note: Estimation was ordinary least squares. Dependent variable set to one if PPP of that type was completed in that state/year. Standard errors are in parentheses;

*** Significant at 1 percent level

** Significant at 5 percent level

** Significant at 10 percent level*

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Appendix A: Additional Tables

Table A1 - Descriptive and Summary Statistics, Reduced Samples

Variable	Sample									
	<i>States that passed laws between 1988 - 2008</i>					<i>States with positive index values only</i>				
	Min	Max	Mean	S.D.	Obs.	Min	Max	Mean	S.D.	Obs.
PPP_ACT (=1 if state has PPP enabling law)	0.00	1.00	0.53	0.50	546	1.00	1.00	1.00	0.00	291
PPP_INDEX (survey-weighted favorability index)	0.00	7.52	1.82	2.09	546	1.36	7.52	3.42	1.66	291
Per capita income (2008 dollars, hundreds)	\$116	\$509	\$260	\$74	546	\$173	\$481	\$298	\$64	291
Per capita income growth (%)	-9.6%	33.2%	4.4%	2.3%	546	-9.6%	33.2%	4.2%	2.7%	291
Population growth (%)	-5.6%	7.8%	1.4%	1.1%	546	-5.6%	4.4%	1.5%	0.9%	291
Motor vehicle registration growth (%)	-53.7%	28.2%	1.8%	4.8%	546	-53.7%	28.2%	2.0%	5.3%	291
Vehicle-miles traveled growth (%)	-8.6%	17.1%	2.4%	2.8%	546	-6.6%	13.0%	1.8%	2.5%	291
Travel Time Index	102	135	117	8	546	106	135	120	7	291
State debt outstanding per capita (2000 dollars, hundreds)	\$5	\$165	\$20	\$18	546	\$6	\$79	\$19	\$11	291
State bond rating	13	21	19	1	507	13	21	20	2	274
Democrats in state House of Representatives (%)	25.0%	95.0%	54.3%	14.1%	546	25.0%	75.0%	49.8%	11.9%	291
Union membership (%)	2.3%	24.4%	12.2%	5.9%	546	2.3%	24.0%	10.8%	5.6%	291
Federal-aid for highways per capita (2000 dollars)	\$0	\$543	\$99	\$77	546	\$0	\$497	\$88	\$48	291
State gas tax receipts per capita (2000 dollars)	\$30	\$198	\$116	\$30	546	\$35	\$168	\$112	\$24	291
State highway expenditures (%)	2.7%	17.8%	8.0%	2.1%	546	2.7%	14.5%	7.3%	1.9%	291

Table A2: Variable Sources

Variable	Source
. PPP Act	Author's compilation
. PPP Index	Author's compilation
. Population Growth	U.S. Census Bureau Population Estimates
. Registration Growth	FHWA Highway Statistics Series
. VMT Growth	FHWA Highway Statistics Series
. Personal Income	Statistical Abstract of the U.S.
. Gas Tax Receipts	FHWA Highway Statistics Series
. Federal Aid for Highways	Statistical Abstract of the United States
. State Highway Expenditures	U.S. Census Bureau, Annual Survey of State Government Finances and Census of Governments
. State Debt Outstanding	U.S. Census Bureau, Annual Survey of State Government Finances and Census of Governments
. State Bond Ratings	Standard & Poor's
. Democrats in State House	Almanac of American Politics (Barone), Source for 2000: Politics in America (CQ)
. Union Membership	www.unionstats.com
. Travel Time Index	Texas Transportation Institute

Table A3: Distribution of PPP Experts Surveyed, by Organizational Type

Organizational Type	Number
Federal Government	4
State-level government	2
Bank or investment firm	1
Design and/or construction firm	2
Toll road operating firm	0
Consulting firm	3
Law firm	0
Academia	2
Think tank/Public-policy research firm	4
Other	3
Total	21

Note: To properly reflect backgrounds, experts were allowed to check more than one organizational type. The total number of survey respondents was 15.

Appendix B: Examples of PPP Enabling Law Preambles

We here provide several examples from the preambles of state PPP enabling laws to offer insights into the explanation given by state legislatures for the passage of these laws. For example, this excerpt is taken from Delaware’s PPP statute:

(d) In addition to alleviating the strain on the public treasury and allowing the State to use its limited resources for other needed projects, public-private initiative projects also do all of the following:

(3) More quickly reduce congestion in existing transportation corridors and provide the public with alternate route and mode selections.

This excerpt is taken from Indiana’s House Bill (HB) 1008, passed in 2006:

There is a public need for timely development and operation of transportation facilities in Indiana that addresses the needs identified by the department, through the department's transportation plan and otherwise, by accelerating project delivery, improving safety, reducing congestion, increasing mobility, improving connectivity, increasing capacity, enhancing economic efficiency, promoting economic development, or any combination of those methods.

Another example is taken from North Carolina's HB 644, passed in 2002:

The General Assembly finds that the existing state road system is becoming increasingly congested and overburdened with traffic in many areas of the state; that the sharp surge of vehicle miles traveled is overwhelming the state's ability to build and pay for adequate road improvements; and that an adequate answer to this challenge will require the state to be innovative and utilize several new approaches to transportation improvements in North Carolina.

Similarly, Indiana's House Bill (HB) 1008, passed in 2006, states that:

There is a public need for timely development and operation of transportation facilities in Indiana that addresses the needs identified by the department, through the department's transportation plan and otherwise, by accelerating project delivery, improving safety, reducing congestion, increasing mobility, improving connectivity, increasing capacity, enhancing economic efficiency, promoting economic development, or any combination of those methods (Burns Indiana Code Ann. §8-15.7-1-1(1)).