

# **Public Private Partnerships in California**

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## **Phase II Report**

### **Section VI: Market for Private Capital**

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## Acronyms and terms defined

The following table presents the acronyms and terms in the report.

**Table 1: Acronyms and terms**

<b>Term or Acronym</b>	<b>Definition</b>
Basel III	A comprehensive set of reform measures (agreed to by the Basel Committee on Banking Supervision) designed to improve the banking sector’s ability to deal with financial and economic stress, improve risk management, and strengthen banks’ transparency.
CalPERS	California Public Employees’ Retirement System
Closing value	The final price at which a security is traded on a given trading day, representing the most current valuation of a security until trading commences on the next trading day. Herein “annual closing value” is the closing value of a security the last trading day of a calendar year (on, or the last business day before, December 31).
Debt-to-equity ratio	A measure of a project’s financial leverage and risk calculated by dividing total debt by the amount of investor equity; the higher the ratio, the riskier the project because the less invested an equity provider is, the more likely they are to withdraw from a deal.
Doyle Drive	The Doyle Drive Replacement Project. Also known as Presidio Parkway. Doyle Drive is the south access road to the Golden Gate Bridge in San Francisco, but originally built in 1937, the roadway is structurally and seismically deficient and must be replaced.
Fed	The US Federal Reserve
GDP	Gross Domestic Product. Market value of all final goods and services produced within a country in a given period.
GII	Global Infrastructure Index. As measured by Standard and Poor’s, the GII provides liquid and tradable exposure to 75 companies from around the world.
Investment Company Act of 1940	This legislation defines the responsibilities and limitations placed on fund companies that offer investment products to the public.
Mark to Market	When a bank adjusts (up or down) the value of an assets to the current market value

Term or Acronym	Definition
Non Recourse	When a creditor is prohibited from seeking repayment from assets other than the value of the asset to which the liability is secured. In P3 finance, facilities are typically held in a Special Purpose Vehicle (SPV, see below). If the cash flow from the facility is insufficient to repay the debt, the creditors are unable to look to the owners' other assets for repayment.
NTP	Notice to Proceed. The date on which a contractor can begin work subject to the conditions of the contract.
OECD	Organization for Economic Cooperation and Development. An international economic organization consisting of 34 countries committed to democracy and the market economy to stimulate economic progress and world trade.
Overexposure	A banking term used when a particular product or geographic region exceeds limits set by a bank's credit committee or management. For example, suppose that a bank sets a limit of \$200 billion in total loans in California and \$500 billion for P3 loans. That bank might not make a P3 loan in California (even if it the first P3 loan in the state) if the bank has loans of another type (e.g., mortgages) that exceed \$200 billion. In this example, the bank was geographically overexposed to California.
P3 or P3s	Public-Private Partnership(s) are contractual agreements formed between a public sponsor and a private sector entity that allow for greater private sector participation in the delivery and financing of transportation projects.
PAB	Private Activity Bonds. In SAFETEA-LU, Congress authorized \$15 billion of tax-exempt bonds that can be issued by states to benefit private companies.
PECG	Professional Engineers in California Government. The union representing state-employed engineers and related professionals.
Presidio Parkway	See Doyle Drive.
Primary Market	The market for new securities, bonds, loans, or other debt instruments. For example, an investor may buy bonds issued by a P3 firm secured by the firm's interest in an infrastructure project. See also secondary market.

<b>Term or Acronym</b>	<b>Definition</b>
Public Sponsor	As used in this report, public sponsor refers to any public agency that might propose, build, and / or maintain a transportation facility, e.g., SFMTA, Metro, Caltrans, or Gold Line Phase II Construction Authority.
RFP	Request for Proposals. Issued by a public sponsor to solicit bids for a project.
RFQ	Request for Qualifications. A document issued by a public sponsor to solicit statements from private firms detailing their a) ability to meet the requirements of the public sponsor and b) interest in a project.
ROW	Right-of-Way. A strip of land legally granted access for a transportation facility.
S&P	Standard & Poor's. A financial services company that rates stocks and bonds to assess the credit worthiness of debt issued by firms or governments, including debt secured by infrastructure (P3 or otherwise).
SAFETEA-LU	Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users. The Department of Transportation reauthorization bill passed in 2005.
Secondary Market	The resale market where investors purchase securities or assets from other investors, rather than from the firms or governments that originally issued them. For example, an investor may sell bonds secured by a P3 firm's interest in an infrastructure project to another investor. See also primary market.
SPV	Special Purpose Vehicle. A stand-alone company (also known as a single purpose entity) created by private investors to hold the assets and liabilities associated with a P3. In the case of a P3, the SPV typically holds only one asset, the facility itself, and one set of liabilities, the debt on the facility.
SR-125	California State Road 125. A ten-mile highway built in San Diego as a P3 concession. Also known as the South Bay Expressway.
TIAA-CREF	Teachers Insurance and Annuity Association – College Retirement Equities Fund.
TIFIA	Transportation Infrastructure Finance and Innovation Act of 1998 that provides credit assistance for transportation projects of both regional and national significance.



## **Introduction**

This section of the report assesses the current US transportation P3 market based on research, historical data, and interviews with people who work at firms in the P3 industry. It includes three parts: P3-market data sources, a summary of the interviews, and our conclusions.

## **P3 market data sources**

This subsection examines the data on the US' P3 market and makes comparisons to the broader market for bonds. It first reviews the market for all US Municipal Bonds, and then the subset of those bonds that are related to transportation. This enables a comparison of that market (and its subset) to the total volume of domestic P3 transactions as well as a comparison of the volume of P3 transactions worldwide. Then, we present data on two indices related to the P3 market. Finally, data on P3 equity funds is offered. A summary of the market findings concludes the subsection.

The following points highlight our major findings of research into the US transportation P3 market:

- In 2010, the total US municipal bond market was approximately 47 times greater than the US transportation-specific municipal bond market;
- The market for US municipal securities issued for transportation increased by approximately 147 percent between 1990 and 2010;

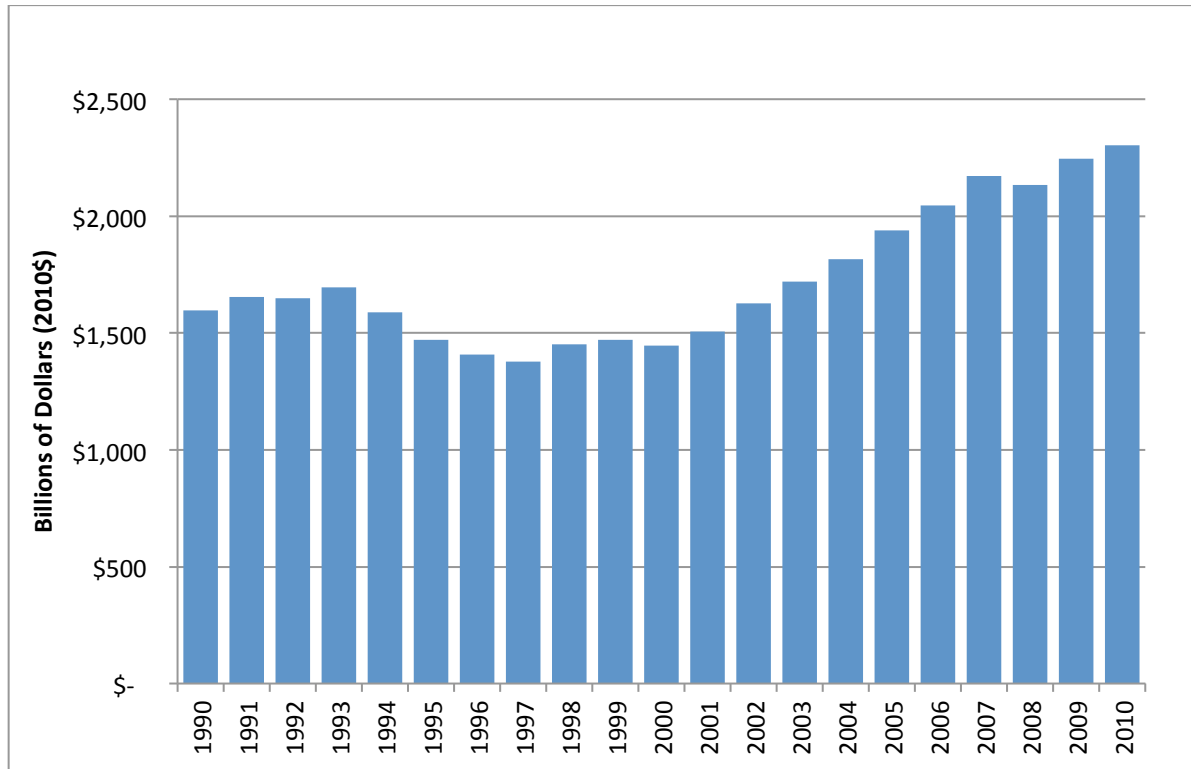
- The number and value of transportation P3 contracts has increased over time, though the volume of transportation P3 transactions fluctuates more than the municipal bond market;
- Europe has the greatest share of transportation P3 contracts in the world (34 percent), followed by Asia and Australia (21 percent), and then the United States (17 percent), which is tied with Mexico, Latin America, and the Caribbean; and
- New P3 equity funds are coming into the marketplace.

### **US municipal bond market**

Figure 1 shows the total size of the municipal bond market between 1990 and 2010.

Over this 20-year period, the real dollar value (in 2010 dollars) of municipal bonds increased 141 percent, from \$957 billion in 1990 to \$2.3 trillion in 2010. Prior to 2000, growth was inconsistent; the value of municipal bonds fell by approximately 18 percent between 1993 and 1997 to \$1.3 trillion. After this decline, municipal bonds grew dramatically, nearly 102 percent in the ten years ending in 2010, though there was a small (2 percent) dip between 2007 and 2008. There has been a rapid rate of increase since the recession, with the value of municipal bonds peaking at \$2.3 trillion in 2010.

**Figure 1: US state and local government long-term municipal securities**



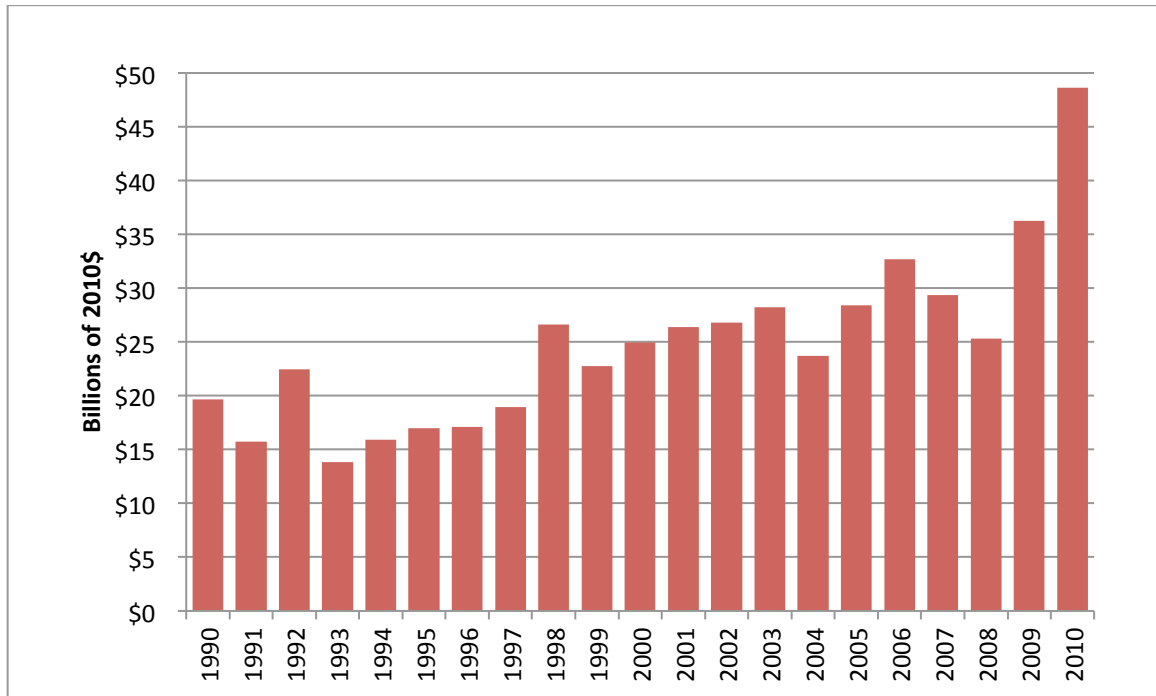
Source, data: USFR 1997-2011; conversion factors: Sahr 2011. Appendix A lists the source year for each data point included in the analysis.

### **US municipal transportation securities market**

The market for US municipal securities issued for transportation has increased significantly over the past 20 years, rising 148 percent from \$19.6 billion in 1990 to \$48.6 billion in 2010 (all values in 2010 dollars). The total growth of the transportation bond market roughly tracks the broader municipal bond market, with 148 percent growth over the 20-year period ending 2010 versus 141 percent growth. There was considerably more year-to-year fluctuation in the transportation bond market than in the total municipal bond market (see Figure 2). In 2010, the transportation-specific municipal bond market was only two percent of the total municipal bond market. The most dramatic drops occurred between 1992 and 1993 (38

percent), 1998 and 1999 (15 percent), and 2003 and 2004 (16 percent). There has been a steep increase in the value of the transportation-specific municipal bond market since the recession, increasing approximately 25 percent from \$36.2 billion in 2009 to \$48.6 billion in 2010.

**Figure 2: US municipal transportation securities**



Source, data: USFR 2008, 2009, 2011; conversion factors: Sahr 2011.

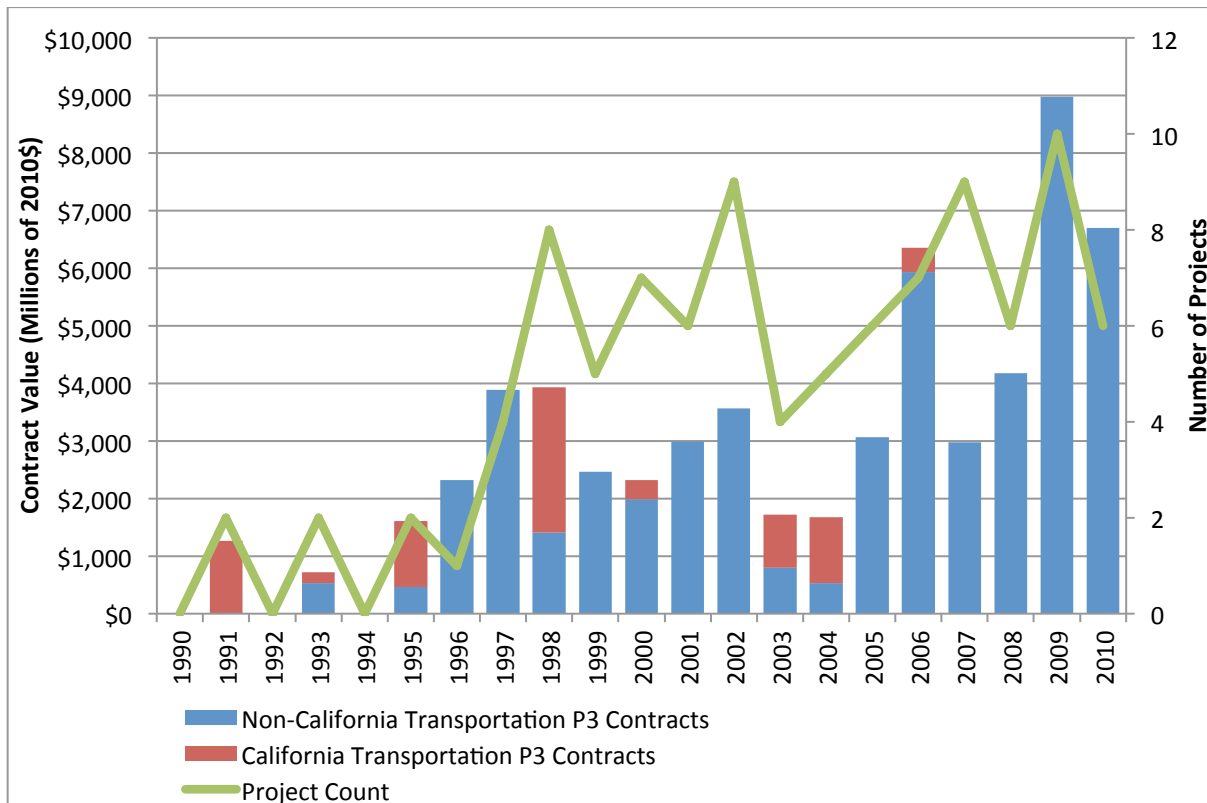
### **P3 transaction totals**

A respected P3 newsletter, *Public Works Financing*, tracks the number and size of P3 transactions in the US; between 1989 and 2011, it recorded 101 transportation P3 projects worth approximately \$54.3 billion (Reinhardt 2011). Figure 3 shows a positive trend in the number of projects and the value of project contracts over time, though the transportation P3 market has fluctuated significantly. In 1989 there was one project with a contract amount of \$567 million, and in 2010, there were six projects worth a total of \$6.7 billion. This change

represents a 1,081 percent increase (admittedly from a small base) in total value of P3 contracts over that time. There were several periods of dramatic decline in contract value: from 1998 to 1999 (37 percent); from 2002 to 2003 (52 percent); from 2006 to 2007 (53 percent); and from 2009 to 2010 (25 percent). Total value of P3 contracts peaked in 2009 at nearly \$9 billion. Over time, the number of projects has only roughly correlated with contract values due to variation in the size of projects in any given year. For example, in 2002 there were nine projects worth \$3.6 billion, and in 2009, there were 10 projects worth \$9 billion.

Nearly 75 percent of total P3 contract value derives from projects from just eight states. Without adjusting for GDP or population, Texas had the largest transportation P3 market, with 18 projects worth \$9.57 billion, representing 17.6 percent of the nation's transportation P3 contracts. California had the second-largest market, with 11 projects totaling \$6.02 billion and representing 11.1 percent of the nation's transportation P3 contracts.

**Figure 3: US transportation P3 projects 1990-2010**



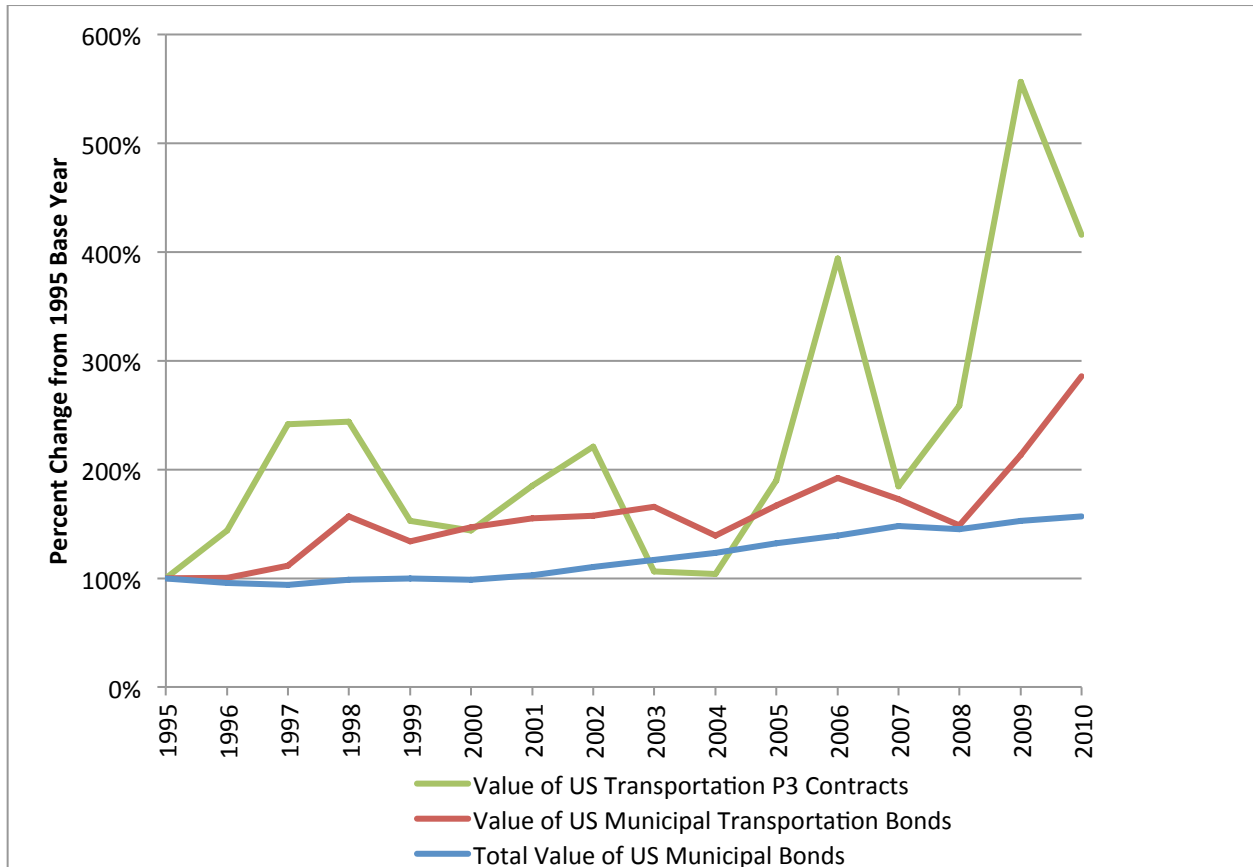
Source, data: Reinhardt 2011; conversion factors Sahr 2011. Note: We used an inventory of US transportation P3 projects from *Public Works Financing*, which releases quarterly reports and maintains a global database of transportation and infrastructure-related P3 projects. Appendix B documents the Public Works Financing project list.

### Comparing the three markets

Figure 4 shows the relative changes in the total US municipal bond market, US transportation-specific municipal bond market, and US transportation P3 market. We chose 1995 as our base year because the P3 market had no transactions in 1990, 1992, and 1994. As discussed above, the US municipal bond market has been the most stable over time, while the

US transportation P3 market has been most volatile, exhibiting the largest and most frequent fluctuations.

**Figure 4: Percent change in bond amounts from 1995**



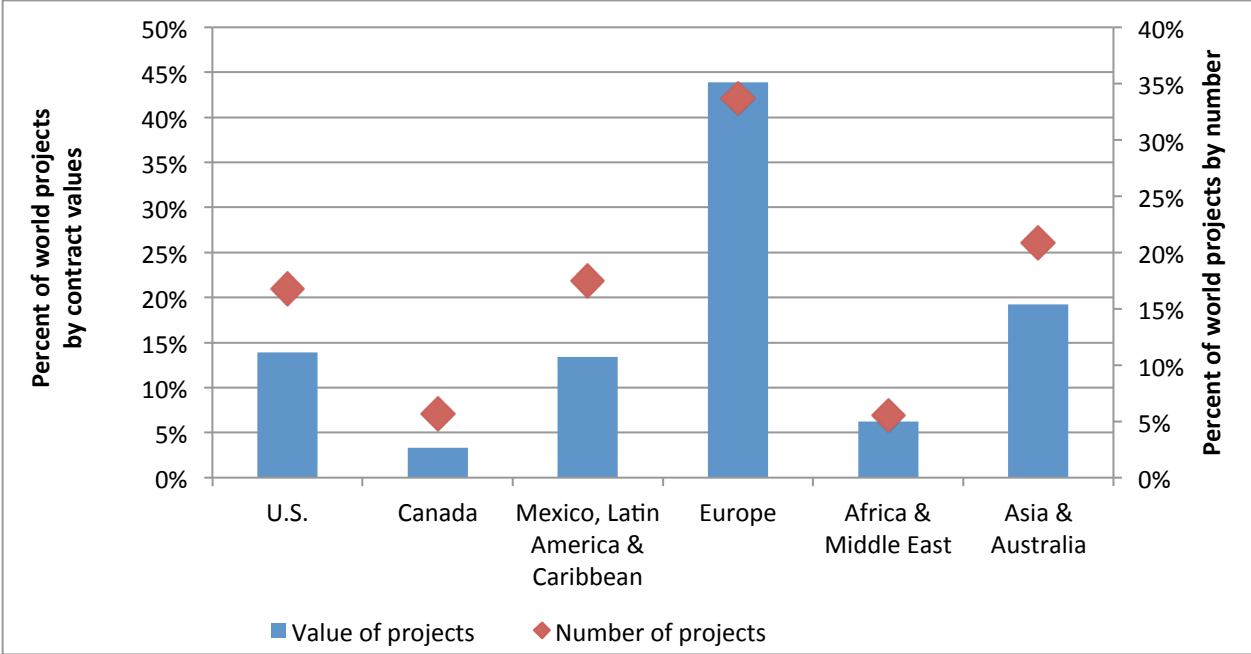
Source, Reinhardt 2011; USFR 1997-2011, 2008, 2009, 2011.

**International comparisons**

Using aggregated data from the *Public Works Financing*, which summarized the number and value of transportation P3s for world regions, we compared the project contract values and number of projects of each region as a percent of the world total. Only cumulative data summarizing total P3 contracts values from 1985 to 2010 was available. Without access to project-level data for each year, we could not convert those values to 2010 dollars. Figure 5 shows that Europe has the greatest number of transportation P3 contracts in the world (34

percent), followed by Asia and Australia (21 percent), and then the United States (17 percent). The ranking order is the same when considering share of transportation P3 contract value, though the spread between first, second, and third place is larger: Europe represents 44 percent of transportation P3 contract values in the world, followed by Asia and Australia (19 percent), and then the United States (14 percent).

**Figure 5: Regional share of global transportation P3 market**



Source, Reinhardt 2010, 2011.

Even without adjusting the number or value of P3 contracts in the world by population or GDP, our quantitative analysis reveals that the US lags in P3s. Europe has twice the number of P3s and three times the value of P3s in the US. Canada, with an economy and population about one-tenth of the US, has approximately one-third the number of P3s. The interviews



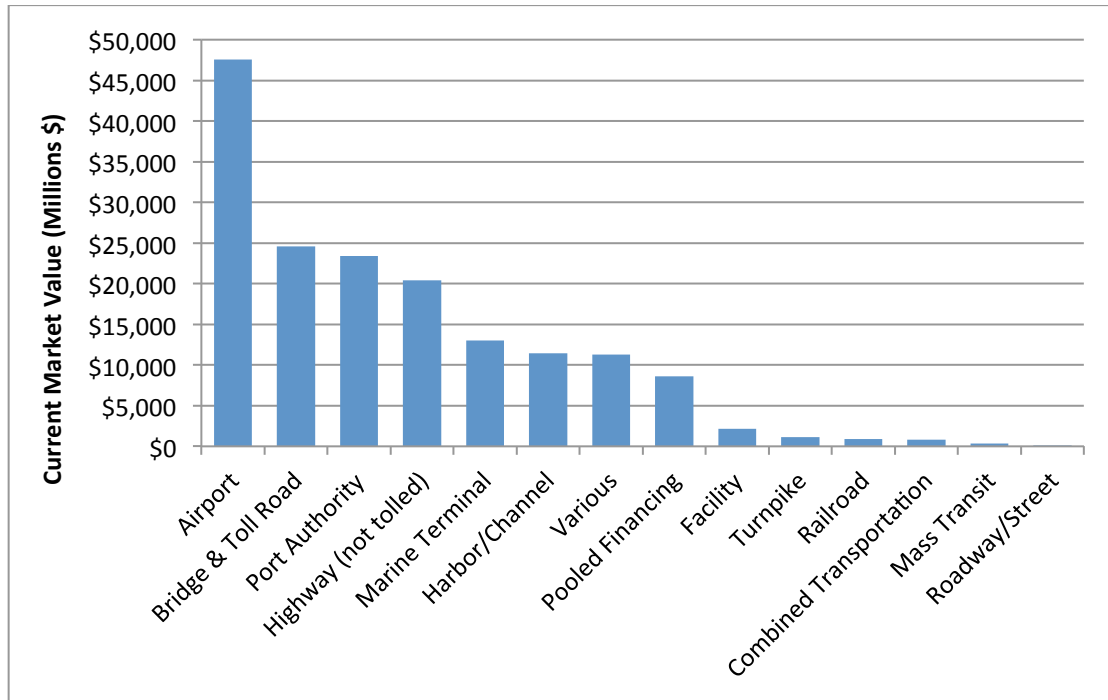
revealed a few characteristics of the US P3 market that make it inherently less attractive to private investors than other world regions.

## Two indices

We could find no third-party indices that track the P3 market, though we found two indices that track related markets. The first index follows domestic municipal transportation bonds. This index's annual closing values increased 36 percent between 1999 and 2009. The second index tracks the combined market value of private firms engaged in infrastructure development (including but not limited to P3 firms.) Its annual closing values grew 62 percent between 2000 and 2010.

Standard & Poor's (S&P) Municipal Bond Transportation Index follows municipal issuers, including the Commonwealth of Puerto Rico and US territories, of bonds for airport, toll road, port authority, and other transportation sectors (S&P 2011b). Figure 6 shows the current breakdown of this index by sector. As of January 2012, airports account for the greatest share of municipal bonds issued for transportation purposes. With a value of \$47.5 million and a 29 percent share, the airport sector is nearly twice the size of the bridges and toll road sector, which represents the second greatest share. Bridges and toll roads are valued at \$24.5 million and account for approximately 15 percent of municipal transportation bonds. Port authorities represent a close third, with a \$23.4 market value and 14 percent market share. These data suggest that across all transportation sub-sectors, airports have recently attracted the most funding for capital improvements, followed by bridges and toll roads and ports.

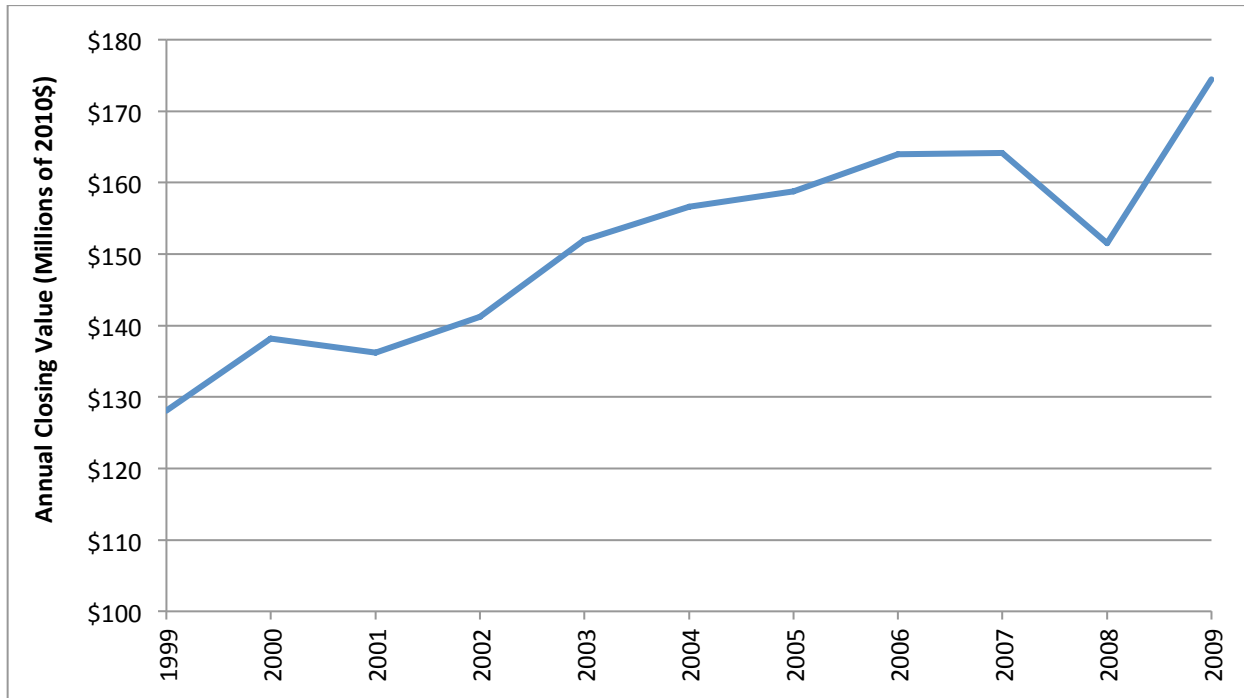
Figure 6: Breakdown of S&P Municipal Bond Transportation Index by sector



Source, S&P 2012.

Figure 7 shows the annual closing values for the Municipal Bond Transportation Index over time. The index's closing values increased approximately 36 percent, from \$128 million in 1999 to \$174 million in 2009, with little fluctuation in between. The most drastic decrease occurred between 2007 and 2008 with an 8 percent drop in closing value, though the market recovered quickly with closing values increasing 15 percent between 2008 and 2009.

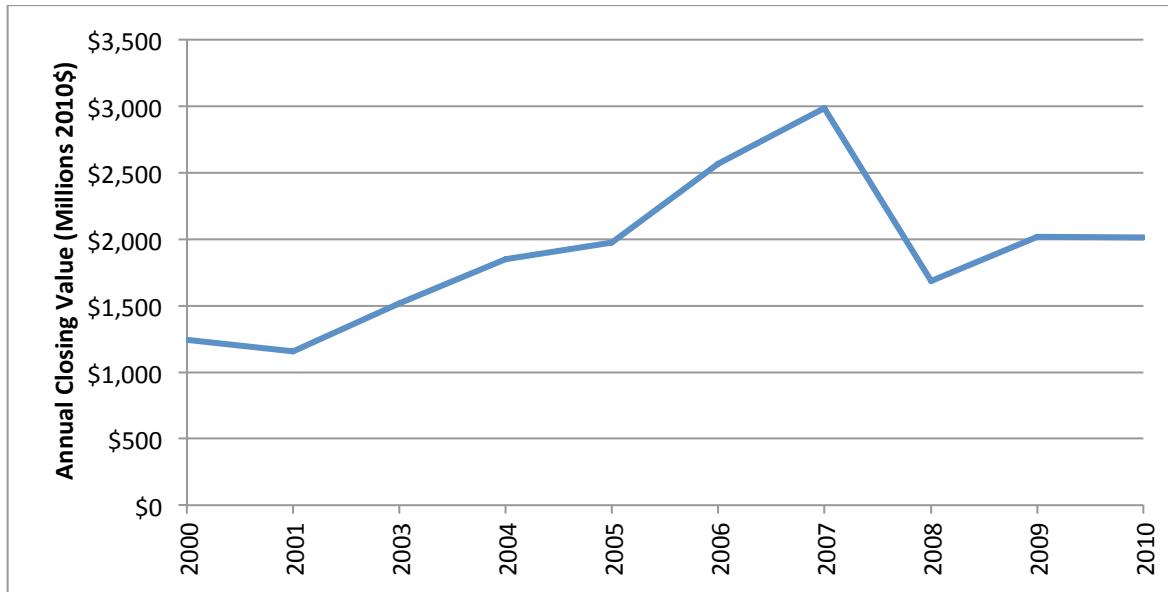
Figure 7: S&P Municipal Bond Transportation Index



Source, data: S&P 2011b; conversion factors: Sahr 2011.

Figure 8 indicates how sensitive P3 firms interested in infrastructure assets are in the current economic climate. The S&P Global Infrastructure Index (GII) is a weighted measure of 75 companies involved in the utilities, transportation, and energy sectors (S&P 2011a). Firms in the transportation sector account for approximately 40.7 percent of the index and US-based firms make up 24 percent of the index. According to the GII, the infrastructure market peaked in 2007 with an annual closing value of nearly \$3 billion. The market then fell by 51 percent over the next year and in 2010 the annual closing value was still 42 percent below the 2007 annual closing value.

**Figure 8: S&P Global Infrastructure Index**



Source, data: S&P 2011a; conversion factors: Sahr 2011.

Growth in the Municipal Transportation Bond index shows the continuous and increasing demand for transportation infrastructure projects. Growth in the GII over time indicates an increase in private infrastructure firms' activities. The former index provides public sponsors with an idea of the market's interest for infrastructure in general. The latter index shows the relative health of firms engaged in infrastructure delivery, including P3s. While neither is an exact proxy for the P3 market, both indicate the health of the market for infrastructure finance.

### **New funds coming to market**

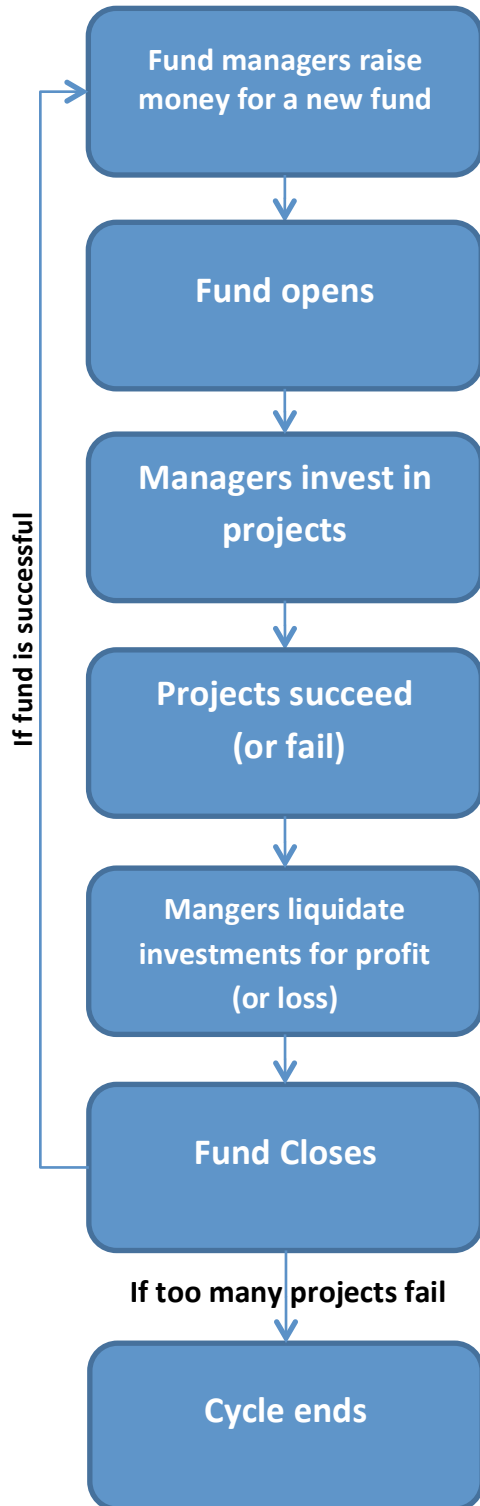
The global infrastructure market has yet to fully recover from the economic downturn, though several equity funds dedicated to infrastructure P3s have recently emerged and raised significant amounts of capital. Such equity funds raised approximately \$19 billion throughout 2010 and the 30 largest funds raised \$140.5 billion between 2005 and 2010 (Poole 2011a). At

of the end of 2010, the 30 largest funds had raised \$183 billion total since their inception (Poole 2011c). A list of these 30 equity funds is available in Appendix E.

Equity funds have a cycle and definite start and end dates. First, managers raise money from investors. Next, the fund opens and the managers begin placing equity (i.e., the investor's money) in transactions. Over the course of a fund's life the managers may enter into new transactions and sell off stakes in older investments. Finally, when the closing date approaches, the managers will sell their stake in the remaining facilities (presumably at a profit) and then return the investors' principal plus interest. One successful fund begets another (usually larger) as managers build a track record and relationships with investors. However, if managers fail to deliver the promised return or worse, fail to return all the investors' principal, they will be out of job; no one will invest in fund run by managers with a poor track record. This is the equity fund cycle and we depict it in Figure 9.

To avoid a failed fund, managers build in a cushion to handle losses on individual transactions. That is, fund managers promise a lower return to their investors than they believe they can get on transactions. Suppose that a fund manager promised a ten percent rate of return. The manager will place money in multiple transactions seeking a 12 percent return. Should one of the transactions fail, the "extra" profit from the others mitigates the risk that the manager will not meet the promised return. If none of the projects fail, the fund returns a substantial profit.

Figure 9: The P3 equity fund cycle



In order to provide some detail of the equity fund market and its cycle, we examined the InfraRed Infrastructure Fund III and Meridiam Infrastructure North America Fund II. (Notice the numbering in the names; these are sequels to successful funds.) These funds were selected because a) they were coming to market at the time of this report, b) we were able to find information (in the normally secretive P3-equity world) on them, and c) they have different goals and time horizons.

The InfraRed fund is a successor of the HSBC Infrastructure Fund I and InfraRed Infrastructure Fund II. Launched in 2001, the former fund raised £125 million (\$194 million), which it invested in 13 new construction P3 projects in Western Europe before selling to HICL Infrastructure in 2006 (InfraRed 2012). The latter fund launched in 2004, raised £300 million, and is currently committed to 22 long-term concession contracts for the construction and operation of those infrastructure assets across the health, education, government accommodation, transport, communication, and renewable energy sectors (InfraRed 2012). Since its establishment in 2010, the present fund has raised \$1.2 billion and is still seeking investments. The fund seeks to invest in a variety of infrastructure assets including hospitals, government facilities, roads, and light rail projects. Unlike its predecessors, however, the fund will expand to other developed markets outside Europe such as North America, Singapore, Hong Kong, and Australia (Poole 2011c).

In contrast to the InfraRed fund's global perspective and short time horizon, Meridiam's new fund will exclusively target P3 projects in North America over 25 years (Poole 2011c). Given the long time horizon, Meridiam will focus on new construction projects. Funds with

shorter time horizons find new construction projects challenging as the period from build-out to stabilized asset may be more than eight years; therefore, most of the shorter-term funds focus on existing facility P3s. Additionally, given the long time horizon, Meridiam expects its primary investors will be insurance companies and pension funds. Secondary investors may include banks or other financial institutions and state-sponsored development banks; the latter would be those development banks that need to diversify their investments outside their normal geographic area. Finally, industrial investors, such as AECOM, will contribute to the fund (Meridiam Infrastructure 2011. Meridiam will not target high net worth investors (i.e., people with liquid investments in excess of \$1 million) because the fund's 25-year time horizon is too long for most non-institutional investors.

For now, as evidenced by the money flowing into equity funds, investors are looking to place equity in P3 transactions.

### **P3 market information summary**

We researched the markets to measure the relative size of the transportation P3 market. The absence of an index measuring the P3-backed bond market, however, made the research challenging. We used contract values as proxies for bond amounts, analyzed market changes over time, and offered global comparisons.

Based on the data collected, the P3 fund market is large and growing faster than the municipal bond market and the transportation specific bond market. This growth in the P3 transaction market suggests that the availability of private investment funds is not a constraint to P3 utilization. The Meridiam and InfraRed funds provided examples of current trends in the equity market, but we could not offer a complete picture of these funds because there is little



publically available information regarding P3 equity funds. The amount of equity raised suggests that there is no shortage of equity either. The opacity of market information could lead to inefficiencies through mismatches between investors and investment opportunities, for example.

Compared to other industrialized nations, the US lags far behind in accessing the private fund market; and, California lags behind the US market when considering state population. Given the growth in P3 funds, why aren't there more P3 transactions in the US or in California? We turned to people with working knowledge and experience in the P3 industry to obtain more information. A discussion of the interviews follows.

## Interviews

After evaluating the US transportation P3 market in the context of the US municipal bond market, the US municipal transportation bond market, and the European P3 market, we interviewed 14 people in the P3 Industry. The major goals of the interviews were to:

- 1) measure the pulse of the P3 market;
- 2) learn how private sector employees perceive the market overall; and
- 3) understand how private sector employees evaluate P3 investment opportunities in California relative to those in other states.

Our sample included P3 advisors (to both public sponsors and private firms) attorneys, bankers, and representatives from ratings agencies. Overall, this section provides insight into sources of

private capital, major players in the market, and the effects of the recent economic crisis on P3 arrangements.

There is no source for identifying the universe of potential interviewees. Consequently, we reached out to two personal contacts (of one of the principal investigators) and then relied on snowballing to schedule the remaining 12 interviews. A sample size of 14 participants is not statistically significant and is not necessarily representative of the P3 market as a whole; however, we are confident in the quality and credibility of the interviews. Even in the small pool of interviewees, however, there is a healthy variety of P3 representatives.

The interviewers took handwritten notes and made audio recordings to verify the accuracy of responses and to provide direct quotes. The subjects are anonymous throughout the report, and all interviewees except one consented to having their firms' names appear in a list on page 59. Two individuals declined to interview, even with the option of withholding their firms' names. The terms of anonymity enabled the interviewees to provide candid responses. We discuss the responses below and highlight where the interviewees had a consensus, as well as any minority views.

Appendix G contains the interview questions. The interviews were semi-structured to follow the order of questions, depending on whether the respondent demonstrated interest in a particular question, wanted to skip questions, move more quickly, digress, or introduce new topics. The major topics of discussion during the interviews included:

- How the participants judge a P3's investment risk and how a project's local and political context influence its attractiveness;

- How the participants assess the present primary and secondary P3 bond markets and how today's market compares to pre-recession conditions, particularly regarding deal structures and terms;
- How reliable traffic and revenue forecasts have been and how that reliability influences investors' decisions;
- How risk transfers, tax advantages, and non-compete clauses influence investors' decisions and how the state can ensure competition and minimize risk for private partners; and
- Challenges facing the P3 market moving forward.

The major findings were:

- Potential investors only consider a state's credit risk (indicative of the agency's ability to pay), an important factor when evaluating an availability payment project (i.e., a P3 where a project's public sponsor pays the private partner based on availability of the facility at a specified performance level). For demand-based projects (i.e., a P3 where user fees are the primary source of funds), investors are more concerned with the individual project's rating and feasibility.
- The P3 industry is part of a global marketplace and is therefore subject to short-term volatilities. Despite the current economic climate, there is sufficient, if not abundant, capital in the world to finance P3s. Refinancing or acquiring existing projects is particularly attractive to investors right now because it is less risky. For example, an existing project such as the Chicago Skyway is less risky because

it has an operating history and there is already a demand established for that facility. But in the long-run capital should flow to all feasible projects.

- Political opposition, environmental permitting, and a difficult budgeting process pose major challenges to California's P3 market, but the interviewees expressed interest in the state and believed that the availability of feasible projects with reliable revenue streams could potentially offset those issues and attract capital.

### **Assessing investment risk**

When we asked interviewees to judge the risk of P3 projects in particular states, the consensus among interviewees was that a state's credit risk is only important when assessing a project dependent on shadow tolls or availability payments. In an availability payment project, a state's credit risk is an important factor for potential investors to consider. A poor credit rating is not necessarily a prohibiting factor for P3s, as the public sponsor may include provisions in the contract to ensure payment for the private party. Additionally, a public sponsor with a low rating can reassure the private partner through hiring experienced advisors; multiple interviewees pointed to experienced P3 advisors as making them more confident in a project. Puerto Rico is one of the most active jurisdictions for P3s despite its BBB rating. In contrast, when evaluating a demand-based project, respondents were indifferent to a state's credit rating.

Once P3 firms are comfortable with the quality of the revenue source (i.e., demand or appropriation risk has been addressed), some of the other factors interviewees consider before entering a transaction include the a) credibility of the public sponsors' advisors; b) reliability of the traffic and demand forecasts, and c) history of deal closings in a state. The more P3

experience a public agency has, the more likely private firms are to invest. Similarly, one respondent explained, “if you’re aware that a transaction in a certain state, because of political complications, is going to take two years, you’re probably not going to do the transaction. If you’re aware that transactions have occurred successfully in three to six months, that’s probably a reasonable time frame to deal with.” The respondents emphasized that if a project is feasible, then every other obstacle can be overcome. Most subjects referred to projects as being either “feasible” or “infeasible” and their implied definition of “feasibility” was a project with a reliable revenue source.

When we asked the interviewees to grade California as a place for potential P3 investment, less than one-third were willing to assign letter grades. Three respondents gave California a D and one gave California a C for having closed a few deals, but that participant added that the grade should be lower than a C because of the state’s political structure, unions, and financial situation. One subject praised the high caliber of people working in the state’s government, but graded California between a C and a B nevertheless. One of the respondents who graded California as a D on the state level said the grade would be the same at the local level because of the local public employees’ lack of preparedness for and knowledge of P3s. The remaining interviewees were hesitant to assign a letter grade; instead, they provided qualitative grades such as “incomplete,” “developing and improving,” “not the best,” or the anecdote that “my job is nationwide to pursue P3 projects for one of the most aggressive players in the P3 market, and I haven’t been in California in four years.”

Interestingly, the bankruptcy of SR-125 did not influence the subjects' assessment of California in general. As a concession, the State had no obligation to make up any shortfall in toll revenue. Indeed it did not, the facility went into bankruptcy; equity investors were wiped out and the debt holders took cuts (see Section VII). Following the bankruptcy, SANDAG purchased the facility. One interviewee reported some frustration that a public sponsor would buy out the private sector following the bankruptcy; they believed that SR-125 should remain in private hands. This interviewee thought, had SR-125 remained in private hands it a) would be an example of how the private sector can manage problems (e.g., by bankruptcy and transfer) when forecasts turn out to be too optimistic, and b) to show how a new private owner could turn around a troubled P3 facility. The presence of a high-profile P3 bankruptcy in the state did not appear to discourage the interviewees from considering other P3s within the state. This is consistent with how equity fund managers deal with risk, see New funds coming to market page 12.

The respondents based their assessment of California on their perception that, even though the state pioneered P3 legislation with AB 680, there has been a distinct lack of progress since then and "California just can't seem to get its act together to encourage P3s." One interviewee clarified that "legislation does not define a program," and P3-enabling legislation alone cannot provide the framework necessary to support P3s. Furthermore, "by the time [the legislature was] trying to pass P3 legislation under [California Governor Arnold Schwarzenegger], the parties and interests that opposed the legislation were clearly organized." Another participant blamed "certain public employee unions" for blocking California's P3 transportation projects. Although another respondent praised the Presidio

Parkway's process, the original interviewee said the low "grade [they] assigned to California is somewhat tied to the opposition and lawsuits brought against [Presidio Parkway], and you would see the same type of challenges in a number of other states, but those states wouldn't include, for example, Florida and Texas."

The subjects consistently mentioned states such as Texas, Virginia, and Florida as having sophisticated and knowledgeable public officials, particularly at the state level, pipelines for projects, and defined P3 processes (though Texas was typically not given high marks for P3 process). Only one interviewee criticized Virginia's process for unsolicited proposals, and another had reservations about Texas following the Sam Rayburn Tollway (State Highway 121) project (see Section V). The respondents were also generally excited about potential investment opportunities in Puerto Rico. We discuss the benefits of Puerto Rico's P3 office below in the Challenges moving forward subsection.

While the interview questions compared California against other US states, respondents were clear that California is competing on a global scale. One respondent explained, "it's not California versus Texas versus Florida by itself; it's California versus Chile, California versus Canada, California versus Mexico ... we can deploy our debt capital in any of those jurisdictions." Therefore, to attract capital, debt and equity, the public sector and its advisors must have strong understandings of the global market for P3s. A company from Spain, France, or Germany may pursue a project in Chile just as easily as it may pursue a project in California. One interviewee described this global marketplace as investors "flow[ing] their capital to the best opportunities," thereby capturing the essence of how capital can move quickly and can

spread anywhere that the investors think will have the lowest risk and highest return. There was a consensus among respondents that the US does not have as smooth a procurement process as other jurisdictions. One interviewee referred to this “jagged” approach and provided the following analogy:

“In Canada, they announce a project, they go to the RFQ stage, they go to the RFP stage, they select a preferred proponent, and they have a financial close. In the US, we do this saw-toothed approach, you know a project is announced, it’s delayed, RFQ is tendered, the RFP is delayed, the RFP is out, the RFP gets delayed, there’s a preferred proponent, and then there’s a delay to get to financial close.”

Multiple participants held up Canada as a strong model for P3 programs. One interviewee reported, “I can’t think of a single state that has a program that rivals the quality and the breadth and depth of what’s being accomplished in Australia, United Kingdom, or Canada. None. Zero.” In addition to following Australia, Canada, and the United Kingdom as global standards for P3s, California could attract more competition if public sponsors lined up permits and approvals before the RFP so that once it selects the winning bid, the project can move forward.

In discussing the global P3 marketplace, the interviewees emphasized the role European banks play in US projects and, therefore, the impact the current European debt crisis may have on the progress of new transactions in the United States. In the absence of European banks, Japanese and Canadian banks have become the most active players in the P3 market. These observations are consistent with our hypothesis from Phase I that a market-wide credit crunch can significantly affect the demand and capital available for financing P3s (Giuliano et al. 2011, p. 84).



## The current market

We asked the interviewees to assess the current primary and secondary P3 finance markets. The subjects agreed that the market is now “tighter” and “more conservative” than it was before the global financial crisis in terms of the “rules of the game,” particularly in the debt-to-equity ratios. There is now generally more equity required in transactions. Before the global financial crisis, one subject said the debt-to-equity ratio reached as high as 92:8 for a particular availability-payment-based project in Canada; for a similar transaction closed post-crisis, that ratio fell to 90:10 or even 85:15. For demand-based projects, the ratio reached 80:20 at the height of the market, but is now 70:30 or 65:35. Banks require less equity in availability payment transactions because they are less risky; governments do not typically go bankrupt and are unlikely to default on their availability payments (see Giuliano et al. 2011, p. 30).

On projects where a private firm is assuming the demand risk the bank is going to have a higher equity requirement to give it more cushion in the event demand does not materialize. This is evidenced by the 8 percent equity requirement for an availability-based deal at the peak of the market versus the 20 percent requirement for a demand-base project. As the broader market tightened, sanity returned to the P3 market. Those banks still in the market for P3s started demanding more equity on the part of private firms for all deals; though bankers were even more conservative on demand-based projects. In the pre-crisis market, the “commercial banks were blind leading the blind” according to one subject; in other words, the 92:8 debt ratios of the peak days were deals written by inexperienced players desperate to do deals.

While availability payment P3s are normally considered less risky, one interviewee mentioned some missed availability payments in some Spanish P3s. *TOLLROADS news*, an industry newsletter, went so far as to report that, “investors now consider toll revenue lending less risky ... than government-backed contracts” because even OECD countries like Spain are defaulting on their “shadow toll” payments (Samuel 2011). Traffic forecasters expect traffic to decrease by 15 percent in Spain, but the performance of government-backed contracts is less predictable, with 100 percent losses a possibility (Samuel 2011). None of our interviewees thought that availability payment P3s were more risky than demand-dependent transactions; however, that sentiment could change if more governments default on debts.

The interviewees did not agree on how the different decision-makers have changed. One participant remarked that there are now only half as many banks interested in the P3 market, whereas another respondent stated that the number of banks is the same as in pre-crisis period, but banks today are less aggressive. Finally, a participant observed that before the crisis, there were approximately 60 to 80 banks in the primary market and 40 banks in the secondary market, but the total number of banks fell to 15 during the crisis and is now around 25.

When we asked the participants about how due diligence has changed since the crisis, most interpreted the question as a self-evaluation rather than a perspective of the market as a whole. Those respondents said their due diligence now is just as conservative as it was before the crisis, but some interviewees said that the due diligence process for vetting projects has become more conservative post-crisis in general. One respondent linked the fluctuating debt-

to-equity ratios, terms, and stringent due diligence standards to human nature; i.e., money flows freely when times are good and when times are bad, bankers are naturally more conservative.

### **Primary market**

Despite those changes in the market following the recession, the majority of interviewees had a positive perception of the current primary market. In general, they reiterated that there is demand for infrastructure investment, and there is sufficient, if not abundant, capital in the world to back P3 projects. Proportionally speaking, equity is more readily available than debt.

While equity players are more interested in higher-return new construction projects, debt providers are most interested in projects involving the refinancing or acquisition of an existing facility. Forecasting future demand on an existing facility is relatively easy because there is already an operating history showing quantifiable demand for the facility; historical revenues and expenses are known. Existing facilities are also more likely to be located in built-out areas (e.g., the Chicago Skyway). Thus, forecasting future demand for an existing facility relies less on new residential construction, as an example of just one factor that could influence demand. In contrast, forecasting demand on a new facility in an undeveloped area is relatively more difficult because one has to make assumptions on future conditions (e.g., new residential and commercial development nearby) that may not come to pass; revenues and expenses are unknown. This inherent risk in a new construction project is precisely why the return on investment needs to be higher—investors need compensation for a higher risk. The high

returns attract equity players to new construction projects, while debt providers prefer the more predictable existing facility projects.

The P3 market is “churning” in that the interviewees said they are busy responding to RFPs, but very few of those RFPs result in deal closings. Between 2005 and 2010, the number of transactions closed has ranged from a low of six to a high of ten (see Figure 3). Over that five-year period, a total of 44 deals worth approximately \$32 billion have closed.

Firms have closed deals, including during and after the recent recession. Comparable to the “if you build it, they will come” and “where there’s a will, there’s a way” mentalities, however, the subjects indicated that if a project is cogent and feasible, then the financing will fall into place and the deal will close. One participant stated that their firm had “closed deals throughout the economic cycle,” indicating that there has been a market for good projects that are properly structured regardless of the economic or political climate. When predicting the P3 market’s near future, the participants agreed that there would be a “trickling” of deal closings, “more of the same with steady increases” and generally “tepid.” These responses suggest that the success rate for any given firm is low, but strong projects will be funded even when capital markets are lean.

Regarding the structure of future deals, one interviewee observed, “on a [state] staff level there’s a growing understanding that transferring ownership doesn’t make any sense ... the model of pure concession is considerably less favored than it was five years ago.”

## Secondary market

Interviewees assessed the secondary market involving the resale of bonds and other debt instruments secured by P3s. Most indicated that the secondary market is illiquid and had the sense that P3 investors are most interested in holding onto bonds until they reach maturity. That said, contemporary P3s contracts build in structures and mechanisms to resell both debt and equity investments anyway. One participant observed that, since financiers are structuring deals for future resale, they must assume that there will be continued market access throughout the project's life. A few respondents mentioned Florida's I-595 concession project as an example of P3-backed bond resale (see Poole 2011b, "ACS Sells" 2011). While the interviewees generally agreed that there is currently not a large demand for the secondary bond market, one respondent suggested that the secondary market might grow in the near future. As banks strive to meet the new, increased capital requirements of Basel III (reform measures designed to improve the regulation, supervision, and risk management for banks), one way that they can achieve those goals is to offload their P3 debt from their balance sheets (Avent 2010). The same participant anticipates that investment banks will create funds and raise capital for buying the commercial banks' debt. Once debt is off a bank's balance sheet, its capital requirement shrinks. So, if the foretold funds actually start buying P3 debt from banks, they can then pursue new P3 transactions. If not, banks will need to raise additional capital in order to make new loans.

While there are few secondary market transactions today, there is enough underlying belief in the strength of the secondary market to enable the primary market to operate efficiently. We thought that the illiquidity of the secondary market might increase the cost of

financing. However, one respondent said there is no up-front premium to compensate for the illiquidity because investors are only marginally interested in re-sale (though banks interest may increase along with the aforementioned capital requirements of Basel III). Another subject disagreed and said there is a premium for illiquidity and that it is priced into the bonds as they are issued. Without any third party monitoring of the market, it is hard to judge which subject is right.

Given the up-front due diligence effort needed to understand the legal context and demand forecasts for a particular project, a buyer in the secondary market may be unwilling to put in the time and effort to calculate the bond's value. From the perspective of the sellers, however, they may want to sell either because the project is in trouble, or because the project has progressed to a point where there is less risk going forward. In the former scenario, the seller may need to unload the project off their balance sheet. In the latter scenario, the seller can sell the bond at a premium because there is less risk involved once a project is completed or operates successfully for a given time. One interviewee suggested that the re-sale of bonds when a project is in trouble is rare because:

“In the bank community there is institutional reluctance to recognize losses...there [are] billions and billions of bank loans on concession deals that have gone bad. The reality is that they're going to go into default, but there's no incentive within the commercial bank industry to recognize the loss any sooner than they have to, so rather than try to sell a position at fifty cents to the dollar, they just don't trade.”

In other words, there is no rush to “mark to market.” This lag is important because as long as bad projects and bad debt are on the books at the original value, rather than the current market value, other people in the broader market have no way of knowing the status of the P3

market as a whole. Without a third-party index to track the P3 bond market, there are significant informational asymmetries (i.e., an imbalance between what buyers and sellers know) in the broader market, which can compound the trading lags and prevent troubled projects from getting access to new capital or management when either might help to turn a project around.

The I-595 P3 backed bond resale indicates how pension funds can potentially boost P3 investment because of their interest in high returns and long time horizons. The I-595 developer/operator, ACS, sold half its equity to one of the largest US pension funds, the Teachers Insurance and Annuity Association – College Retirement Equities Fund (TIAA-CREF) (Poole 2011b) for \$812 million in October 2011 (“ACS sells” 2011). Comparably, the California Public Employees’ Retirement System (CalPERS) currently has a 12.7 percent equity interest in the London Gatwick Airport (CalPERS 2010; see Giuliano 2011, p. 86) and in September 2011, the fund earmarked \$800 million for investments in California’s infrastructure over the next three years (CalPERS 2011). One respondent said this infrastructure program could provide a “shot in the arm” for P3s in California, though another participant questioned, “if there was so much pension money ready to be invested in governmental projects, how come the Build America Bond program was essentially ignored by all the pension funds in this country?” Like any potential private partner, pension funds will scrutinize a P3 project’s feasibility before investing in it.

### **Data sources**

When we asked about what data sources the interviewees relied on to form their assessments of the primary and secondary markets, their references were consistent with the

sources identified in our initial research. The subjects confirmed our conclusion that there is no known index measuring the P3 market directly. The respondents cited the following publications as data sources and industry news:

- *InfraAmericas*
- *Infrastructure Investor*
- *Infrastructure Journal*
- *Infrastructure News*
- *P3 America*
- *Project Finance*
- *Public Works Financing*
- *The Bond Buyer*
- *TOLLROADSnews*

Besides reading those publications, however, the participants also discussed potential investments directly with states proposing projects and commercial banks. Conferences were also mentioned. Though, one interviewee said that over the past 15 years, P3 conferences have been “of diminishing use ... because they are really talking about the same projects without identifying a meaningful number of new projects.”

## Forecasting

Participants also reported on their experience with developing or evaluating demand and revenue forecasts. The respondents generally agreed that forecasts have been unreliable. One subject said, “the road to hell is paved with traffic forecasts,” while another admitted that their firm “starts from the premise that every traffic forecast is wrong” because, according to a third interviewee, traffic forecasts “are never reliable.” Finally, two respondents independently cited the adage regarding feasibility studies, “you cannot get paid for an *in*feasibility study.” Another participant confirmed that explanation, as “so many traffic firms were willing to



provide these reports that basically told lenders what the sponsors wanted to [hear].” Thus, actual traffic performance has rarely aligned with traffic forecasts. In support of their criticisms, the participants cited one or more of the following sources regarding the reliability of traffic and revenue forecasts: Bain, 2009a; Bain, 2009b; Bain & Plantagie, 2004; Buono & Muller, 2002; Muller, 1996; Flyvberg, Skamris, and Buhl 2004. Contrary to the general pessimism about traffic and revenue forecasts, one respondent knew of investors who were more optimistic about future revenue and willing to invest in demand-based projects despite the historic unreliability of traffic forecasts in the hopes of an upside.

The respondents suggested that most people at the P3 negotiating table do not have an incentive for getting the traffic or revenue forecast right. The equity players are typically playing with other people’s money while the debt providers are lower on the stack, i.e., they are less likely to lose money if the project faces financial difficulties (see Giuliano et al. 2011, pp. 77-82). In the end, the deal negotiators are strictly incentivized to get the deal closed, and they may look the other way if the traffic or revenue forecast is not good. One interviewee said they once worked on a project where “the people in the room all had a financial incentive in getting the deal closed and unfortunately had no financial stake to getting it right” because of the firm’s reliance on non-recourse special purpose vehicles. Another subject described reaching financial close as “the golden ring.”

While forecasts would seem to be necessary and desirable when negotiating a P3, their unreliability and inaccuracy does little to deter equity investors. Investors use many techniques to limit their potential for losses. First, they discount the forecast such that even if the actual

usage is below the forecast, they can still make a profit. Second, equity fund managers a) employ non-recourse debt financing, b) create single purpose entities, and c) sell off pieces of their equity state to others; all these financial techniques limit any potential losses. Third, managers invest in multiple projects in a single fund; that way if one goes bad the profits from the other facilities can make up for any losses. However, fund managers cannot escape the fact that if they make too many mistakes, and the losses are too great, they will not be able to raise money for a new fund after the current one closes (see Figure 9).

Participants also reported few post-operational comparisons with revenue forecasts. Once a project is complete, it either fulfills or fails its original revenue forecast. If a project is successful and fulfills its revenue forecast, then there is little incentive to conduct a post-operational analysis. If the project does not fulfill its revenue forecast, then its investors try to refinance and reform the project rather than spending time and money on conducting a post-operational analysis.

Only one respondent shared a post-operation analysis with us. In this case, contrary to expectations, the post-operation analysis showed that the original revenue forecast was incredibly accurate. A 1999 revenue forecast for 2011 was only 3 percent higher than the 2011 actual revenue. Thus, even with the global recession, which would have been impossible to predict in 1999, the original revenue forecast was accurate. Many interviewees commented on the recession's effect on traffic, but the recent recession does not account for the large disparities in general. One subject proposed that the reliability of revenue forecasts is insignificant for a project's public sponsor: if the private partner defaults to its lenders because

of poor toll revenues, then the public agency may take over a concession project early for some modest payment of depreciated capital cost.

### **Ensuring competition**

To encourage maximum competition amongst private firms, the state should maintain a competitive tax environment and hire credible advisors.

When asked about tax law advantages afforded to P3s that would influence their decision to invest in any particular state, approximately half of the respondents did not have the necessary knowledge or experience to discuss such issues. Nevertheless, those interviewees who were knowledgeable unanimously agreed that there is nothing uniquely prohibitive within California's tax code. One participant indicated that California's regulatory issues with CEQA and environmental permitting are unique and are more prohibitive than the tax code. According to the respondents, Virginia, Indiana, and Puerto Rico have tax advantages for P3s, but one interviewee said those tax incentives are not strong enough to make investors favor those jurisdictions over others that do not have the same accommodations for P3s. Virginia offers a special exemption of real estate or leasehold taxes for concessionaires in Virginia, while Puerto Rico has a flat tax of ten percent on all P3 concessionaires. Those jurisdictions have included such provisions in demand-based transactions likely to avoid any "unduly taxes" that would result in either higher project costs or an increase in tolls levied by the private partner.

The interviewees said P3s should be exempt from property taxes as well as sales taxes on toll revenues, because if the public sector were to deliver the same facilities for public benefits, it would not be subject to such taxes. One subject elaborated on that point, saying

that private entities that build a road in California should not be subject to a property tax that Caltrans would not have to pay if it were to provide the same facility. The respondents repeatedly used the language “leveling the playing field” between private and public sectors. Because P3s face property and sales taxes (from which the public sector is exempt), public officials believe that the private sector consequently has a higher cost of project delivery. Thus, one interviewee suggested that changes in the tax code to “level the playing field” would make P3s more attractive and cost-competitive with traditional finance models. Ultimately, it is unclear whether the respondents were concerned with their projects being subject to taxation in general or whether they were concerned about public sector projects that directly compete with private concessions.

We asked the subjects if their firms had voluntarily dropped out of a P3 project and, if so, what the public sponsor could have done differently to maintain the firm’s interest in the deal. A few respondents cited unreliable P3 advisors, disagreements between partners, and bank overexposure (i.e. a high concentration of debt) in a particular state as reasons for voluntarily dropping out from a bid. While a public sponsor cannot do anything to prevent disagreements on the private side or bank overexposure, it can hire credible advisors. No one gave us a definition of “credible advisor.” So, public sponsors should evaluate the past performance and experience when selecting P3 advisors or consultants.

### **Minimizing risks**

Risk transfer is one of the purported benefits of P3 arrangements. We break our risk discussion into four topics. First, the subjects recognized the inherent risk involved in demand and revenue forecasts, especially for new construction projects in undeveloped areas. Second,

we highlight the myriad of risks the subjects said they would never assume. Third, one interview described appropriation risk. Finally, we share the subjects' thoughts on the risk that public sponsors might build a competing facility.

As discussed above, the interviewees almost universally acknowledged the unreliability of traffic forecasts, as well as the key players' lack of incentives for getting the traffic forecasts right (see Forecasting on page 32). Given this pessimism, the respondents generally discount traffic forecasts; though some interviewees mentioned that forecasts from credible project advisors would carry more credence. In availability payment P3s, the forecast is virtually meaningless. In demand-dependent facilities, the incentive for an optimistic forecast is strong. One interviewee disagreed with this practice so much, that they ceased consulting on a concession project because the traffic engineer was pressured to improve the forecast.

There were certain risks that the interviewees would never accept from the public sector, however. Those risks involved environmental or geotechnical issues, particularly environmental permitting, hazardous materials cleanup, subsurface soil conditions, and natural disasters. Private partners also consider the risks of terrorist events to be a public responsibility. Under the Terrorism Risk Insurance Program Reauthorization Act, the US government will continue providing reinsurance coverage to insurance companies for claims related to terrorist acts through the act's expiration in 2014. The US Congress first enacted this legislation in 2002 and has extended it twice since then (Zielezienski 2008). One participant highlighted the risk to a P3 transaction should Congress fail to renew the terrorism insurance

act. Lastly, the subjects mentioned Right of Way (ROW) acquisition and costs of utility relocation as risks they would not accept.

One participant cited the inherent risk of P3 projects being subject to future appropriation actions. Many agencies cannot commit to making any payments beyond the current fiscal year, so potential investors will scrutinize a public sponsor's statutory limitation on appropriating future funds. If the public agency's board must appropriate funds through its budgeting process as a condition of payment, then the private firm will look for a grant or funding agreement to ensure receipt of payments. Similarly, for demand-based projects, potential private partners may be wary if future price increases on a toll road, for example, will require approval by the public agency and consequently be subject to future political conflicts or regulation. Interviewees differed on the issue of non-compete clauses. Some respondents said non-compete clauses are "impediments to new investment" that "should be avoided" or at least "should not be done unless absolutely necessary" and which "prove over time to be less than ideal." One respondent concluded, "if you end up spending a lot of money on an improvement ... it's very unlikely that public funds are going to be spent to compete with that ... it's just not logical." Another interviewee said that, even if states want to maintain the opportunity to build a competing facility, there would likely be little space, and ROW acquisition would likely be cost-prohibitive. Those interviewees not in favor of non-compete clauses emphasized the need for maintaining flexibility given that it is impossible to predict the needs of the future. Consequently, current elected officials should not tie the hands of public officials ten or 20 years into the future. Many of those same respondents referred to the SR-91 project and the restrictions to expansion that its non-compete clause imposed.

By contrast, other participants said “there has to be some protection for a bidder,” that “lenders will not finance a project if [a non-compete clause] does not exist,” or proposed modified and limited non-compete clauses. For example, one respondent said a limited non-compete clause that a) mitigates risk of the private sector, but does not b) provide indefinite protection would be best, so that the public agency would not be hampered from making improvements in serving the safety and mobility needs of the future. Similarly, another interviewee proposed a payment provision in lieu of a non-compete clause where, if the public sponsor builds a competing facility and diverts traffic away from the private facility, then the public sponsor will reimburse the private sector, based on traffic analyses, accordingly. Ultimately, such a provision would not inhibit the public entity from future improvements (though those improvements would be more costly with the compensation provision), nor would it unduly harm the private entity.

### **Challenges moving forward**

Finally, we asked the interviewees what challenges face the P3 industry moving forward. The respondents cited political opposition, lack of a systematic approach, lack of experience, and a shortage of financially feasible projects as key obstacles to future P3 growth. One participant said, “[P3 advocates are] all a bunch of liars...the biggest challenge is that the P3 market never was what it was represented to be.” The same participant went on to say, “they’ve over-promoted this ... people are convinced there’s some holy grail here, that they can fund infrastructure by engaging the private sector, and it’s a bunch of nonsense.” In reality, “permitting drives construction [and] construction drives finance,” so a project is either feasible or infeasible, but “changing the legal structure doesn’t change the feasibility.” Another

participant emphasized the importance of providing subsidies for finance options, such as the tax-exempt Private Activity Bonds (PABs) or low-interest TIFIA loans because if a new surface transportation bill dissolved those sources, then costs for financing P3s would escalate.

P3 offices at the federal and state levels could provide the resources and expertise to manage P3 transactions. Currently, professionals who have skill sets in other areas are working on P3s, but establishing a P3 office would professionalize and institutionalize P3 delivery. Respondents told us such an office would ideally be located outside the Department of Transportation, comparable to the model in Puerto Rico, where the presence of one office overseeing transportation, education, and other P3 projects has effectively streamlined and eliminated redundancies for the P3 process (see Section V). One interviewee reported that because the US P3 experience has centered on transportation, it has been difficult for policymakers and practitioners to discuss P3s for other asset classes such as energy, communications, water and waste, and social infrastructure. Because Puerto Rico, the United Kingdom, Canada, and Australia engage in a wider spectrum of P3s, those jurisdictions have more experience and can achieve efficiencies. The United States focuses only on transportation P3s and consequently has fewer deals and fewer investment attractions when compared with other jurisdictions.

In California, there are imminent political obstacles for P3s. As one subject said, “political consensus is a prerequisite for there to be a business consensus.” To achieve political consensus, one respondent suggested that policymakers look at a variety of infrastructure finance options—rather than viewing P3s in isolation—so that they may choose from those



options “rather than saying ‘no’ to everything.” Such political opposition has stunted the growth of a P3 market in California, and while investors are interested in the state, the state must improve its track record for P3s. As one respondent said, “the market really needs to execute transactions to continue to grow; that will draw equity and debt capital because there will be more encouragement for execution.”

## **Conclusion**

The “Historical Trends” subsection explored the US transportation P3 market in the context of the US municipal bond market, the US municipal transportation bond market, and the global P3 market. We researched these markets to measure the relative size of the transportation P3-backed bond market, but the absence of an index measuring the P3-backed bond market proved challenging. We used contract values as proxies for bond amounts, analyzed market changes over time, and offered global comparisons.

The Meridiam and InfraRed funds exemplified current trends in the equity market, but we could not offer a complete picture of these funds because there is typically little publicly available information regarding P3 equity funds. A representative at Meridiam explained that P3 funds generally desire to avoid the Investment Company Act of 1940 regulations. Thus, firms treat their P3 funds as ‘private placements’ (selling securities to a relatively small number of select investors) rather than ‘public offerings’ (making securities available for sale on the open market). Therefore, few details of any P3 fund are available to us or to the public. Ultimately, we turned to people with working knowledge and experience in the P3 industry to obtain more information.

We interviewed people who work in the private sector of the P3 market to assess whether the participants' responses were consistent with our expectations and the findings of our preliminary research. We are confident in the credibility and content of our interviews, even though our sample size of 14 subjects was not statistically significant or necessarily representative of the broader P3 market. As we relied on each participant to recommend additional contacts, we felt that our hearing the same names repeatedly was indicative of the small, tight network that exists within the P3 market. Where necessary, we conducted further research to verify the respondents' facts and ideas.

In accordance with our Phase I report, the interviewees confirmed that the P3 market's volatility resulted from failures in other capital markets as well as from market-wide credit crunches (Giuliano et al. 2011, p. 84). Many respondents referenced the effects of the recession and Euro crisis on traffic forecasts' reliability, due diligence, and debt availability. Given the weakness of European banks, one respondent stated that a project needing \$400 million or more in debt might be difficult to finance presently. While the research shows how the P3 market is global and subject to such short-term volatility, over the long run the financial market has an almost infinite supply of capital.

The bankruptcy of SR-125 did not influence the participants' perspectives on California. The respondents discussed current political and budgetary challenges facing the state and graded California poorly as a place to invest in a P3, but many expressed interest in California because it is such a large state with tremendous infrastructure needs. First, however, California would need to resolve its difficult permitting process and political volatility.

Though P3s are valuable tools for procuring large transportation projects, even P3 professionals do not see public-private partnerships as a “holy grail” or “magical recipe” of infrastructure finance. Ideally, if California adopted an approach similar to that found in places like Canada, Australia, or the UK, including a P3 office and a definite pipeline<sup>1</sup> of multiple P3 projects, the respondents believe that California would see more P3s (see also Section V). California could also benefit from increased public awareness of P3s, less political opposition and interference, and greater confidence from the financial markets in general. If California is serious about attracting P3s to the state, it will need to overcome the political, structural, and environmental issues described by the interviewees. That said, the interviewees emphasized that the existence of feasible projects *with reliable revenue streams* would attract capital even if some (or all) of those issues remained unresolved.

Our research and interviews found that there is plenty of capital out there for P3s, though unforeseen risks may curtail funds availability in the future. When considering P3s, the investors are only interested in making a profit, so the evaluation metric is, if we invest, will we get our expected return? Thus the more secure the payback stream, the better. Likewise, the higher the risk that a private firm might not get its expected return, the more the firm will charge. This explains (in general) the greater willingness to buy operating assets versus investing in new assets, for example, and the greater willingness to do projects with availability payments.

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<sup>1</sup> By referring to a “project pipeline,” interviewees meant for public sponsors to have a transparent process for programming projects one after another so that potential private partners could be aware of upcoming projects.

We found three main conclusions. First, California has not institutionalized P3s. There is no institutional infrastructure or policies, so every deal is a single, unique deal. This limits progress along the learning curve. It also reduces investor willingness to bid. Why would a P3 equity investor spend time in California if she knew that there was only one deal to be had? Without a pipeline of transactions investors have little incentive to get their feet wet in California. If there were more information available, and if the process were clearly identified, there would be more interest among investors (all else equal).

Second, there are significant barriers in California, and until these barriers are addressed, P3s are not going to happen frequently. Examples cited by the interviewees are, the environmental approval process, the political process, conflicts with unions, etc.

Finally, there is no evidence of a shortage of capital or willing investors, which suggests that limitations to P3s are on the government/public side.

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## Appendix A

Table 2: Municipal bond data point source years

Data Year	Source Year	Amount (\$B)	Conversion Factor (Sahr 2011)	Amount (Billions 2010\$)	% Change from 1995 (2010\$)	Source Link
1990	1997-June	\$ 957.3	0.599	\$ 1,598.2	109%	<a href="http://www.federalreserve.gov/releases/z1/19970612/z1r-4.pdf">http://www.federalreserve.gov/releases/z1/19970612/z1r-4.pdf</a>
1991	1998-June	\$ 1,034.5	0.625	\$ 1,655.2	113%	<a href="http://www.federalreserve.gov/releases/z1/19980611/z1r-4.pdf">http://www.federalreserve.gov/releases/z1/19980611/z1r-4.pdf</a>
1992	1999-June	\$ 1,059.8	0.643	\$ 1,648.2	112%	<a href="http://www.federalreserve.gov/releases/z1/19990611/z1r-4.pdf">http://www.federalreserve.gov/releases/z1/19990611/z1r-4.pdf</a>
1993	1999-June	\$ 1,124.9	0.663	\$ 1,696.7	115%	<a href="http://www.federalreserve.gov/releases/z1/19990611/z1r-4.pdf">http://www.federalreserve.gov/releases/z1/19990611/z1r-4.pdf</a>
1994	2001-June	\$ 1,080.7	0.680	\$ 1,589.3	108%	<a href="http://www.federalreserve.gov/releases/z1/20010608/z1r-4.pdf">http://www.federalreserve.gov/releases/z1/20010608/z1r-4.pdf</a>
1995	2001-June	\$ 1,027.5	0.699	\$ 1,470.0	100%	<a href="http://www.federalreserve.gov/releases/z1/20010608/z1r-4.pdf">http://www.federalreserve.gov/releases/z1/20010608/z1r-4.pdf</a>
1996	2001-June	\$ 1,014.1	0.720	\$ 1,408.5	96%	<a href="http://www.federalreserve.gov/releases/z1/20010608/z1r-4.pdf">http://www.federalreserve.gov/releases/z1/20010608/z1r-4.pdf</a>
1997	2004-June	\$ 1,014.3	0.736	\$ 1,378.1	94%	<a href="http://www.federalreserve.gov/releases/z1/20040610/z1r-4.pdf">http://www.federalreserve.gov/releases/z1/20040610/z1r-4.pdf</a>
1998	2004-June	\$ 1,087.1	0.748	\$ 1,453.3	99%	<a href="http://www.federalreserve.gov/releases/z1/20040610/z1r-4.pdf">http://www.federalreserve.gov/releases/z1/20040610/z1r-4.pdf</a>
1999	2006-June	\$ 1,123.4	0.764	\$ 1,470.4	100%	<a href="http://www.federalreserve.gov/releases/z1/20060608/z1r-4.pdf">http://www.federalreserve.gov/releases/z1/20060608/z1r-4.pdf</a>
2000	2007-June	\$ 1,142.4	0.790	\$ 1,446.1	98%	<a href="http://www.federalreserve.gov/releases/z1/20070607/z1r-4.pdf">http://www.federalreserve.gov/releases/z1/20070607/z1r-4.pdf</a>
2001	2008-June	\$ 1,224.0	0.812	\$ 1,507.4	103%	<a href="http://www.federalreserve.gov/releases/z1/20080605/z1r-4.pdf">http://www.federalreserve.gov/releases/z1/20080605/z1r-4.pdf</a>
2002	2009-June	\$ 1,342.2	0.825	\$ 1,626.9	111%	<a href="http://www.federalreserve.gov/releases/z1/20090611/z1r-4.pdf">http://www.federalreserve.gov/releases/z1/20090611/z1r-4.pdf</a>
2003	2010-June	\$ 1,452.7	0.844	\$ 1,721.2	117%	<a href="http://www.federalreserve.gov/releases/z1/20100610/z1r-4.pdf">http://www.federalreserve.gov/releases/z1/20100610/z1r-4.pdf</a>
2004	2011-June	\$ 1,572.3	0.866	\$ 1,815.6	124%	<a href="http://www.federalreserve.gov/releases/z1/Current/z1r-4.pdf">http://www.federalreserve.gov/releases/z1/Current/z1r-4.pdf</a>
2005	2011-June	\$ 1,737.9	0.896	\$ 1,939.6	132%	<a href="http://www.federalreserve.gov/releases/z1/Current/z1r-4.pdf">http://www.federalreserve.gov/releases/z1/Current/z1r-4.pdf</a>
2006	2011-June	\$ 1,894.2	0.925	\$ 2,047.8	139%	<a href="http://www.federalreserve.gov/releases/z1/Current/z1r-4.pdf">http://www.federalreserve.gov/releases/z1/Current/z1r-4.pdf</a>
2007	2011-June	\$ 2,067.2	0.951	\$ 2,173.7	148%	<a href="http://www.federalreserve.gov/releases/z1/Current/z1r-4.pdf">http://www.federalreserve.gov/releases/z1/Current/z1r-4.pdf</a>
2008	2011-June	\$ 2,105.3	0.987	\$ 2,133.0	145%	<a href="http://www.federalreserve.gov/releases/z1/Current/z1r-4.pdf">http://www.federalreserve.gov/releases/z1/Current/z1r-4.pdf</a>
2009	2011-Sept	\$ 2,211.2	0.984	\$ 2,247.2	153%	<a href="http://www.federalreserve.gov/releases/z1/current/z1r-4.pdf">http://www.federalreserve.gov/releases/z1/current/z1r-4.pdf</a>
2010	2011-Sept <sup>a</sup>	\$ 2,302.8	1.000	\$ 2,302.8	157%	<a href="http://www.federalreserve.gov/releases/z1/current/z1r-4.pdf">http://www.federalreserve.gov/releases/z1/current/z1r-4.pdf</a>
2011	2011-Sept <sup>b</sup>	\$ 2,283.9	1.015	\$ 2,250.1	153%	<a href="http://www.federalreserve.gov/releases/z1/current/z1r-4.pdf">http://www.federalreserve.gov/releases/z1/current/z1r-4.pdf</a>

Note. The Fed revises recent quarters in each successive report due to the availability of new data, so we used the most recent reports in which any given year is included. The *Flow of Funds* report includes detailed tables about US Municipal Securities and Loans. The "Municipal Securities and loans" table, number L.211 in each report (see example in Table 5), lists the values of long-term municipal securities in billions of dollars, represents the amounts outstanding at the end of each period, and does not seasonally adjust those numbers. The table aggregates data on a national level, and we referenced the numbers listed in the "State and Local Government" line item of table L.211. For our analysis, we created a graph showing the levels of US long-term municipal securities over time using data from the Flow of Funds reports and conversion factors from Sahr (2011). For more details on the conversion to 2010 dollars, see Table 3.

<sup>a</sup>Based on Q4

<sup>b</sup>Based on Q2

Source, data: USFR 1997-2011; conversion factors: Sahr 2011.



## Appendix B

Table 3: US transportation P3 project list

Year of Notice to Proceed	Project	State	Contract Amount (nominal\$)
1989	E-470 Beltway Seg 1	CO	\$323
<b>1989 Count</b>			1
<b>1989 Total</b>			\$323
1991	San Joaquin Hills Toll Rd	CA	\$790
<b>1991 Count</b>			1
<b>1991 Total</b>			\$790
1993	Dulles Greenway Toll Road	VA	\$350
1993	91 Express Lanes	CA	\$130
<b>1993 Count</b>			2
<b>1993 Total</b>			\$480
1995	Foothill Eastern Toll Road	CA	\$803
1995	E-470 Beltway Seg 2-3	CO	\$324
<b>1995 Count</b>			2
<b>1995 Total</b>			\$1,127
1996	Hudson-Bergen Lt Rail	NJ	\$1,674
<b>1996 Count</b>			1
<b>1996 Total</b>			\$1,674
1997	I-15 Reconstruction	UT	\$1,376
1997	JFK Terminal 4	NY	\$689
1997	I-95 Relocation Providence	RI	\$610
1997	Atl City-Brigantine Tunnel	NJ	\$191
<b>1997 Count</b>			4
<b>1997 Total</b>			\$2,866

<b>Year of Notice to Proceed</b>	<b>Project</b>	<b>State</b>	<b>Contract Amount (nominal\$)</b>
1998	Alameda Corridor	CA	\$712
1998	Foothill South Toll Road	CA	\$645
1998	BART SF Airport Ext	CA	\$530
1998	Conway Bypass Highway	SC	\$386
1998	US 550 (was SR 44)	NM	\$295
1998	Southern Connector	SC	\$191
1998	Portland Airport Max Rail	OR	\$125
1998	Anton Anderson Tunnel	AK	\$57
<b>1998 Count</b>			8
<b>1998 Total</b>			\$2,941
1999	Jamaica-JFK Airtrain	NY	\$980
1999	Trenton River Lt Rail	NJ	\$508
1999	Carolina Bays Pkwy	SC	\$226
1999	I-17 Thomas to Peoria	AZ	\$86
1999	Camino Colombia Bypass	TX	\$85
<b>1999 Count</b>			5
<b>1999 Total</b>			\$1,885
2000	Route 3 North	MA	\$385
2000	Las Vegas Monorail	NV	\$343
2000	Hiawatha Lt Rail	MN	\$291
2000	God Line Light Rail	CA	\$267
2000	Rt 228	VA	\$236
2000	E-470 Beltway Seg 4	CO	\$233
2000	Hathaway Bridge	FL	\$82
<b>2000 Count</b>			7
<b>2000 Total</b>			\$1,837

<b>Year of Notice to Proceed</b>	<b>Project</b>	<b>State</b>	<b>Contract Amount (nominal\$)</b>
2001	I-25 T-REX Road/Rail Exp	CO	\$1,186
2001	Cooper River Bridge	SC	\$541
2001	Palm Beach-FL Taud Rail	FL	\$232
2001	US 60 Upgrade	AZ	\$184
2001	Northwest Parkway Lease	CO	\$180
2001	I-4 Over St Johns River	FL	\$102
<b>2001 Count</b>			6
<b>2001 Total</b>			\$2,425
2002	SH 130 Seg 1-4	TX	\$1,369
2002	Tacoma Narrows Bridge	WA	\$615
2002	Blue Line Ext	DC	\$220
2002	Rt 28 Corridor	VA	\$198
2002	Reno ReTRAC	NV	\$171
2002	US 64 Knightdale Bypass	NC	\$132
2002	US 70	NM	\$129
2002	Belt Parkway	NY	\$56
2002	New River Bridge	FL	\$53
<b>2002 Count</b>			9
<b>2002 Total</b>			\$2,943
2003	SR 125 So + Connectors	CA	\$773
2003	Route 28 Expansion	VA	\$390
2003	US 52 Reconstruction	MN	\$232
2003	Carolina Bays ph 2	SC	\$54
<b>2003 Count</b>			4
<b>2003 Total</b>			\$1,449

<b>Year of Notice to Proceed</b>	<b>Project</b>	<b>State</b>	<b>Contract Amount (nominal\$)</b>
2004	Eastside Light Rail	CA	\$600
2004	SR 22 Improvements	CA	\$390
2004	US 183 Austin	TX	\$178
2004	S Route 1 Key West	FL	\$148
2004	I-494 Reconstruction	MN	\$136
<b>2004 Count</b>			5
<b>2004 Total</b>			\$1,452
2005	Chicago Skyway	IL	\$1,830
2005	I-10 Bridges Escambia Bay	FL	\$243
2005	TH 212	MN	\$238
2005	I-15 Everett HOT Lanes	WA	\$221
2005	US 20	OR	\$130
2005	Sawgrass Expwy Widen	FL	\$81
<b>2005 Count</b>			6
<b>2005 Total</b>			\$2,743
2006	Indiana Toll Road	IN	\$3,850
2006	Pocahontas Parkway Lease	VA	\$611
2006	I-64 St. Louis	MO	\$420
2006	LA Expo Lt Rail	CA	\$390
2006	I-15 Bridge Replacements	UT	\$238
2006	US 17 Washington Bypass	NM	\$192
2006	I-205 LRT Ext	OR	\$180
<b>2006 Count</b>			7
<b>2006 Total</b>			\$5,881

<b>Year of Notice to Proceed</b>	<b>Project</b>	<b>State</b>	<b>Contract Amount (nominal\$)</b>
2007	Northwest Parkway Lease	CO	\$603
2007	I-71 Collier + Lee Counties	FL	\$469
2007	Intercounty Connector	MD	\$464
2007	IROX I-75	FL	\$431
2007	I-15 North	NV	\$251
2007	St Anthony Falls Bridge	MN	\$234
2007	I-95 Widening	FL	\$211
2007	US 1 Improvements	FL	\$111
2007	I-77 Rehab	NC	\$59
<b>2007 Count</b>			9
<b>2007 Total</b>			\$2,833
2008	I-495 HOT Lanes	VA	\$1,998
2008	SH 130 Secments 5-6	TX	\$1,358
2008	281 North toll	TX	\$328
2008	Palmetto Exp Widening	FL	\$177
2008	95 Express Lanes	FL	\$138
2008	95 Express Lanes	FL	\$121
<b>2008 Count</b>			6
<b>2008 Total</b>			\$4,120
2009	North Tarrant Express	TX	\$2,047
2009	I-595 Managed Lanes	FL	\$1,814
2009	I-15 South	UT	\$1,100
2009	DFW Connector	TX	\$1,002
2009	Port of Miami Tunnel	FL	\$914
2009	Safe and Sound Bridge	MO	\$700
2009	Western Wake Freeway	NC	\$446
2009	Highway 161	TX	\$414
2009	Anacostia River Bridges	DC	\$260
2009	Triangle Parkway	NC	\$138
<b>2009 Count</b>			10
<b>2009 Total</b>			\$8,835

<b>Year of Notice to Proceed</b>	<b>Project</b>	<b>State</b>	<b>Contract Amount (nominal\$)</b>
2010	I-635 LBJ Managed Lanes	TX	\$2,800
2010	Denver Eagle P3 Rail	CO	\$2,100
2010	SR-99 Tunnel	WA	\$1,089
2010	I-4 Connector Hillsboro	FL	\$446
2010	I-485 Charlotte Loop	NC	\$140
2010	Orange Line Bridge	OR	\$127
<b>2010 Count</b>			6
<b>2010 Total</b>			\$6,702
2011	Alaskan Way Viaduct	WA	\$1,350
2011	Jordan Bridge	VA	\$100
<b>2011 Count</b>			2
<b>2011 Total</b>			\$1,450
<b>Grand Count</b>			8
<b>Grand Total</b>			\$8,152

*Note.* The *Public Works Financing* documented contract amounts of P3 transportation projects that a) were worth more than \$50 million at the time of project signing (rather than the total project cost at the time of opening), and b) had received a Notice to Proceed (NTP) between July 1989 and January 2011. Furthermore, *Public Works Financing* recorded each project in the year of its NTP, not its opening year. Finally, *Public Works Financing* recorded each project contract value in nominal dollars, but we converted those values to 2010 dollars for our analysis.

Source, Reinhardt 2011.

# Appendix C

## Table 4: Conversion to 2010 dollars

### Consumer Price Index (CPI) Conversion Factors 1774 to estimated 2021 to Convert to Dollars of 2010

Estimates for 2011-2021 are based on the average of OMB and CBO estimates as of January and February 2011. They will be revised in 2012.

To convert dollars of any year to dollars of the year 2010, DIVIDE the dollar amount from that year by the conversion factor (CF) for that year. For example, \$1000 of 1929 = \$12,821 of 2010 (\$1000 / 0.078).

To reverse the process, that is, to determine what a 2010-dollar amount would be in dollars of another year, simply MULTIPLY the year 2010 amount by the conversion factor for that year. For example, \$1000 of 2010 would be about \$84 in 1840 (\$1000 x 0.084 = \$84).

Data series since 1812 have changed periodically, so numbers are not all precisely comparable. Therefore it is recommended that numbers be ROUNDED to four (or, more cautious, three) significant digits. So, \$12,821 in the example above becomes \$12,820 or \$12,800. For years prior to 1813, rounding to three (or more cautious, two) significant digits is recommended, e.g. \$12,821 becomes \$12,800, or \$13,000.

Year	CF	Year	CF	Year	CF	Year	CF	Year	CF	Year	CF	Year	CF
1774	0.037	1814	0.081	1854	0.030	1894	0.039	1934	0.081	1974	0.226	2014	1.068
1775	0.035	1815	0.071	1855	0.040	1895	0.039	1935	0.083	1975	0.247	2015	1.090
1776	0.040	1816	0.065	1856	0.039	1896	0.039	1936	0.084	1976	0.261	2016	1.113
1777	0.049	1817	0.061	1857	0.040	1897	0.038	1937	0.086	1977	0.278	2017	1.139
1778	0.063	1818	0.058	1858	0.038	1898	0.038	1938	0.085	1978	0.290	2018	1.164
1779	0.058	1819	0.058	1859	0.038	1899	0.038	1939	0.084	1979	0.333	2019	1.189
1780	0.063	1820	0.054	1860	0.038	1900	0.039	1940	0.084	1980	0.378	2020	1.218
1781	0.051	1821	0.052	1861	0.040	1901	0.039	1941	0.087	1981	0.417	2021	1.242
1782	0.055	1822	0.054	1862	0.046	1902	0.039	1942	0.075	1982	0.443		
1783	0.049	1823	0.048	1863	0.058	1903	0.040	1943	0.079	1983	0.457		
1784	0.047	1824	0.044	1864	0.072	1904	0.041	1944	0.081	1984	0.478		
1785	0.044	1825	0.045	1865	0.075	1905	0.040	1945	0.083	1985	0.493		
1786	0.044	1826	0.045	1866	0.073	1906	0.041	1946	0.089	1986	0.503		
1787	0.043	1827	0.046	1867	0.068	1907	0.043	1947	0.102	1987	0.521		
1788	0.041	1828	0.044	1868	0.065	1908	0.042	1948	0.111	1988	0.543		
1789	0.040	1829	0.043	1869	0.082	1909	0.042	1949	0.109	1989	0.569		
1790	0.042	1830	0.042	1870	0.080	1910	0.044	1950	0.111	1990	0.599		
1791	0.043	1831	0.040	1871	0.058	1911	0.044	1951	0.119	1991	0.625		
1792	0.044	1832	0.039	1872	0.058	1912	0.044	1952	0.122	1992	0.643		
1793	0.045	1833	0.039	1873	0.055	1913	0.045	1953	0.122	1993	0.663		
1794	0.050	1834	0.039	1874	0.052	1914	0.046	1954	0.123	1994	0.680		
1795	0.058	1835	0.040	1875	0.050	1915	0.046	1955	0.123	1995	0.699		
1796	0.061	1836	0.043	1876	0.049	1916	0.050	1956	0.125	1996	0.720		
1797	0.058	1837	0.044	1877	0.048	1917	0.059	1957	0.129	1997	0.736		
1798	0.056	1838	0.043	1878	0.046	1918	0.069	1958	0.133	1998	0.748		
1799	0.058	1839	0.043	1879	0.046	1919	0.079	1959	0.133	1999	0.784		
1800	0.058	1840	0.040	1880	0.047	1920	0.062	1960	0.136	2000	0.790		
1801	0.058	1841	0.040	1881	0.047	1921	0.062	1961	0.137	2001	0.812		
1802	0.049	1842	0.038	1882	0.047	1922	0.077	1962	0.138	2002	0.825		
1803	0.052	1843	0.034	1883	0.046	1923	0.078	1963	0.140	2003	0.844		
1804	0.054	1844	0.034	1884	0.045	1924	0.078	1964	0.142	2004	0.866		
1805	0.054	1845	0.035	1885	0.044	1925	0.080	1965	0.144	2005	0.896		
1806	0.056	1846	0.035	1886	0.043	1926	0.081	1966	0.149	2006	0.925		
1807	0.053	1847	0.038	1887	0.044	1927	0.080	1967	0.153	2007	0.951		
1808	0.058	1848	0.036	1888	0.044	1928	0.078	1968	0.160	2008	0.987		
1809	0.056	1849	0.035	1889	0.042	1929	0.078	1969	0.168	2009	0.984		
1810	0.056	1850	0.036	1890	0.042	1930	0.077	1970	0.178	2010	1.000		
1811	0.060	1851	0.035	1891	0.042	1931	0.070	1971	0.186	2011	1.015		
1812	0.061	1852	0.035	1892	0.042	1932	0.063	1972	0.192	2012	1.030		
1813	0.073	1853	0.035	1893	0.041	1933	0.060	1973	0.204	2013	1.048		

Revised June 27, 2011, using final 2010 CPI (CPI = 2.18058) and OMB and CBO inflation estimates for 2011-2021 as of January-February 2011. For inflation assumptions for 2011 and later years, see the shaded box below.

CPI is CPI-U, the broader measure for all urban consumers, year-to-year average (not December to December).

Conversion factors for years before 1913 are re-based from data from the *Historical Statistics of the United States Millennium Edition* (Cambridge University Press, 2006). Calculation starting 1913 uses the CPI-U as the base, from the US Bureau of Labor Statistics. Monthly and annual CPI data are available at the BLS web site: <http://stats.bls.gov/cpi/home.htm#data> (CPI-U = all urban consumers).

**Inflation assumptions:** Inflation conversion factors for 2011 and later years assume 1.45% in 2011, 1.59% in 2012, 1.75% in 2013, 1.90% in 2014, 2.05% in 2015, 2.15% in 2016, 2.25% in 2017, and 2.20% in 2018-2021. These are averages of OMB and CBO inflation estimates as of January-February 2011.

CF denominated in years 1995 to estimated 2011 in Excel and pdf formats for years 1774 to estimated 2021 are available at the online address indicated below.

Prior to the 2008 revision, a different data base was used for the period starting 1865 and ending 1913. See the main inflation conversion factor page for details.

The address of the inflation conversion factor web page is: <http://oregonstate.edu/ols/pollsci/pouity-research/sahr/sahr.htm>.

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Rev 06/27/2011

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Source, Sahr 2011.

# Appendix D

## Table 3: Example of L.211 table

### L.211 Municipal Securities and Loans

Billions of dollars; amounts outstanding end of period, not seasonally adjusted

	2006	2007	2008	2009	2010				2011			
					Q1	Q2	Q3	Q4	Q1	Q2	Q3	
<b>1 Total liabilities</b>	<b>3212.2</b>	<b>3448.1</b>	<b>3543.4</b>	<b>3697.9</b>	<b>3730.8</b>	<b>3730.7</b>	<b>3734.7</b>	<b>3795.6</b>	<b>3778.6</b>	<b>3750.5</b>	<b>3733.6</b>	<b>1</b>
2 State and local governments	2709.7	2855.9	2875.0	2985.7	3008.6	3000.2	3003.5	3051.1	3031.2	2998.3	2987.2	2
3 Short-term (1)	34.3	51.2	55.9	63.6	63.7	47.3	52.0	63.0	60.1	37.6	48.0	3
4 Long-term	2675.4	2804.7	2819.2	2922.1	2945.0	2952.9	2951.5	2988.1	2971.0	2960.7	2939.2	4
5 Nonprofit organizations (2)	230.1	250.7	258.7	264.6	265.7	263.5	260.8	262.3	261.9	260.7	256.1	5
6 Nonfinancial corporate business (industrial revenue bonds)	272.4	341.5	409.7	447.5	456.4	466.9	470.3	482.3	485.4	491.4	490.3	6
<b>7 Total assets</b>	<b>3212.2</b>	<b>3448.1</b>	<b>3543.4</b>	<b>3697.9</b>	<b>3730.8</b>	<b>3730.7</b>	<b>3734.7</b>	<b>3795.6</b>	<b>3778.6</b>	<b>3750.5</b>	<b>3733.6</b>	<b>7</b>
8 Household sector	1681.4	1725.4	1767.2	1898.5	1932.5	1936.7	1917.6	1957.6	1959.2	1929.8	1904.1	8
9 Nonfinancial corporate business	28.1	29.2	26.2	27.1	23.2	20.1	21.3	20.8	20.2	20.0	19.7	9
10 Nonfarm noncorporate business	5.8	5.3	4.9	5.1	5.0	4.9	4.9	4.9	4.9	4.9	4.9	10
11 State and local governments	5.1	5.5	5.4	5.7	5.9	5.9	6.0	6.1	6.2	6.1	6.0	11
12 Rest of the world	34.4	45.1	50.5	57.0	61.0	65.0	69.0	73.0	75.2	77.2	78.5	12
13 U.S.-chartered commercial banks	178.9	190.9	214.1	215.1	216.2	218.4	226.4	243.5	249.0	256.2	272.8	13
14 Foreign banking offices in U.S.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14
15 Banks in U.S.-affiliated areas	1.3	2.0	2.5	3.5	3.1	2.0	2.7	2.5	2.8	2.5	2.8	15
16 Savings institutions	11.2	11.0	7.8	9.2	9.6	10.1	10.2	11.1	10.9	11.1	11.1	16
17 Property-casualty insurance companies	335.2	371.3	381.9	369.4	364.0	358.7	353.5	348.4	349.7	348.2	349.9	17
18 Life insurance companies	36.6	41.4	47.1	73.1	81.3	90.5	100.8	112.3	115.1	116.1	117.7	18
19 State and local govt. retirement funds	3.3	2.4	1.4	1.5	1.5	1.5	1.6	1.6	1.6	1.6	1.5	19
20 Money market mutual funds	370.3	471.0	494.6	401.3	370.0	352.0	333.0	334.4	320.7	305.8	292.0	20
21 Mutual funds	344.4	372.2	389.6	480.2	501.5	514.2	532.8	526.6	515.1	520.1	527.7	21
22 Closed-end funds	89.4	91.3	77.9	80.9	81.1	81.3	81.7	80.3	79.6	79.6	78.5	22
23 Exchange-traded funds	0.0	0.6	2.3	5.9	6.5	7.3	7.8	7.6	7.5	7.7	7.8	23
24 Government-sponsored enterprises	36.1	33.3	31.3	29.1	28.0	27.2	26.2	24.9	23.8	22.9	22.0	24
25 Brokers and dealers	50.9	50.1	38.7	35.4	40.3	35.0	39.2	40.0	37.0	40.6	36.6	25

(1) Debt with original maturity of 13 months or less.

(2) Liability of the households and nonprofit organizations sector (tables F.100 and L.100).

Source, USFR 2011.



## Appendix E

Table 4: 30 Largest infrastructure equity funds, 2010

Rank	Fund	Headquarters	Five-Year Capital Formed (\$M)
1	Macquarie Group	Sydney	\$ 30,655
2	Goldman Sachs	New York	\$ 9,100
3=	Alinda Capital Partners	New York	\$ 7,000
3=	Industry Funds Management	Melbourne	\$ 7,000
5	Ontario Muni Employees Retirement System	Toronto	\$ 6,222
6	Caisse de depot et placement du Quebec	Montreal	\$ 6,111
7	Brookfield Asset Management	Toronto	\$ 5,777
8	Global Infrastructure Partners	New York	\$ 5,640
9	Ontario Teachers Pension Plan	Toronto	\$ 4,862
10	Highstar Capital	New York	\$ 4,300
11	Canada Pension Plan Investment Board	Toronto	\$ 4,250
12	Morgan Stanley	New York	\$ 4,000
13	Arcus Infrastructure Partners	London	\$ 3,564
14	Citi Infrastructure Investors	New York	\$ 3,400
15	ABP	Amsterdam	\$ 3,191
16	Ferrovial	Madrid	\$ 2,974
17	British Columbia Investment Management Corporation	Victoria	\$ 2,683
18	RREEF Alternative Investments	San Francisco	\$ 2,659
19	Balfour Beatty	London	\$ 2,593
20	J.P. Morgan	New York	\$ 2,560
21	3i Group	London	\$ 2,453
22	QIC	Brisbane	\$ 2,416

23	Australian Super	Sydney	\$	2,416
24	Tenaska Capital	Omaha	\$	2,400
25	Public Sector Pension Investment Board	Montreal	\$	2,314
26	UBS	Zurich	\$	2,300
27	Actividades de Construccion y Servicios	Madrid	\$	1,948
28	Future Fund	Melbourne	\$	1,920
29	Steel River Infrastructure Partners	San Francisco	\$	1,900
30	CP2	Sydney	\$	1,859
<b>Total Funds Raised 2005-2010</b>				<b>140,467</b>

Source, Poole 2011a.

## Appendix F

### Private firms interviewed

- Alameda Corridor Transportation Authority
- Anonymous Bank
- Clary Consulting
- Fitch Ratings
- Greenhill
- Jeffrey A. Parker & Associates, Inc.
- KPMG
- Macquarie
- Mercator Advisors
- Nossaman, LLP
- Piper Jaffray
- Scotia Bank
- Sperry Capital
- Table Rock Capital

## Appendix G

### Private firm interview questions

1. How do you judge the risk of investing in a P3 in a particular state?
  - 1.1. Do you consider the state's credit rating and bond rates?
  - 1.2. Do you consider a state's past experience/track record with P3's?
    - 1.2.1. Do you consider how long past transactions took from the Request for Proposals stage to deal closing? Are some states better than others? If so, please list those states.
  - 1.3. What letter grade would you give California as a place to invest in a P3, where A is excellent and F is failure? Please explain the factors that influenced your decision.
  - 1.4. Is there anything else that you use to judge a state's credit risk?
  - 1.5. Are there any states that you would not invest in? Why?
  - 1.6. Are there any states that you would really like to be investing in? Why?
2. How is the primary P3 financial market looking (that is, the market for bonds to finance new transactions)?
  - 2.1. What is your forecast for the primary market (that is, new P3 transactions) in 2011? 2012?
  - 2.2. What are your data sources on the size of the primary market?
3. How is the secondary P3 finance market looking (that is, the re-sale market for bonds secured by P3s)?
  - 3.1. In your opinion, how long was the market "frozen" during the financial crisis? Have you seen any evidence of a recovery in the P3 market?
  - 3.2. Are bonds trading now? If so, when do you think this market became liquid?
  - 3.3. What are your data sources on the size of the secondary market?
4. Are there any other data sources or indices that we should look at?
5. Compare a recently closed P3 transaction with a deal your firm closed before the global financial crisis, e.g., something that closed in 2006.
  - 5.1. Were there more banks offering financing for the earlier deal than for the recent P3 transaction? [If not, were there fewer? What was the difference?]
  - 5.2. Are the players different?

- 5.2.1. Are there new banks in the P3 market?
  - 5.2.2. Have banks exited the P3 market? Which banks?
- 5.3. Was there a difference in the terms of the two deals? If so, what?
- 5.4. Was there a difference in the financial institution's due diligence? If so what?
6. When you consider a particular project for investment, what information do you have, or use, to generate revenue forecasts?
  - 6.1. Do you have access to the demand forecasts conducted as part of the project's planning and environmental review?
  - 6.2. Do you use these forecasts, or do you hire your own consultants?
7. What is your experience with demand and revenue forecasting in general?
  - 7.1. Looking back over past projects, how reliable were these forecasts? Would you provide some specific examples?
  - 7.2. How useful are your forecasting tools or consultants in helping you make sound investments?
    - 7.2.1. Are you able to provide a copy of any post-operation analysis? For example, we would love to know if demand forecasting tool x or consultant y predicted 100,000 users per weekday and you actually saw 95,000 users.
8. Can you think of a time when your firm planned to bid on a project but at some point in the process voluntarily dropped out? If so:
  - 8.1. What was the primary reason?
  - 8.2. Did some of your competitors drop out too?
  - 8.3. Did the deal close?
  - 8.4. What could the public sponsor have done differently?
9. Are there risks that you will not assume no matter the price offered by the public sponsor? If so, what are those, and why are they deal-breakers?
10. What are your views on non-compete clauses?
11. Has the bankruptcy of SR-125 in San Diego affected your outlook on California?
12. Tax laws and rates:
  - 12.1. Is there anything unique to California tax law that would prevent you from participating in a P3 in the state?

12.2. Do other states have tax advantages afforded to P3s that make investment more attractive than California?

13. What are the challenges facing the P3 industry going forward?

14. Is there a shortage of projects for your firm to bid on?

15. Do you have any recommendations for anyone else we should interview?