Back in the 1960s, California was known for more than just Hollywood, The Beach Boys and beautiful scenery. The state was also famous for its unparalleled infrastructure. California had one of the world’s most extensive transportation infrastructure programs in the late 1950s and early 1960s, which paved the way for much of the state’s subsequent economic prosperity.

Those times seem like ancient history in California and throughout America. Today, crowded schools, traffic-choked roads, deteriorating bridges, and aged and overused water and sewer treatment facilities undercut the economy’s efficiency and erode the quality of American life (see figure 4-1). The American Society of Civil Engineers (ASCE) estimates that the United States currently only invests about half of what is needed to bring the nation’s infrastructure up to a good condition.

The consequences of neglected roads, bridges, public transit, electricity grid and other social infrastructure (such as hospitals and schools) have not gone unnoticed by the public. An overwhelming majority of Americans — 94 percent — are concerned about the condition of the nation’s infrastructure. Remarkably, 81 percent say they are willing to pay 1 percent more on their federal income tax to improve America’s infrastructure.64 Business leaders echo the public’s concern about the widening gap between infrastructure needs and current spending. Among surveyed senior business executives, 77 percent believe that the current level of public infrastructure is inadequate to support their companies’ long-term growth. These executives believe that over the next few years, infrastructure will become a more important factor in determining where they locate their operations.65

While there is widespread agreement on the need to address the growing public infrastructure deficit, both to create jobs in the short term and as a prerequisite for enhancing economic development and competitiveness in the longer term, states find themselves in a difficult and precarious position with respect to how to pay for it. At the federal level, infrastructure is largely funded out of general revenues and diminishing highway trust funds. While the 2009 American Recovery and Reinvestment Act (ARRA) provided an infusion of federal funds for infrastructure to the tune of $113 billion, the stimulus funds fall far short of what is required to align public infrastructure with the overall demand, which the American Society of Civil Engineers pegs at $2.2 trillion over the next five years.66 With insufficient political will to increase the gas tax and renewed pressure to reduce the federal deficit, it seems unlikely that states will see a significant near-term increase in federal funds to help close the gap.
4-1. America’s infrastructure deficit by the numbers

By 2020, every major U.S. container port is projected to be handling at least 2 times the volume it was designed to handle.

Railroads are projected to need nearly $200 billion in investment over the next 20 years to accommodate freight increases.

Aging sewer systems spill an estimated 1.26 trillion gallons of untreated sewage every single year, resulting in an estimated $50 billion in cleanup costs.

Costs attributed to airline delays are expected to triple to $30 billion from 2000 to 2015.

Approximately a third of America’s major roadways are in substandard condition—a significant factor in a third of the more than 43,000 traffic fatalities in the United States each year.

More than 25 percent of America’s nearly 600,000 bridges need significant repairs or are burdened with more traffic than they were designed to carry.

The number of dams in the United States that could fail has grown 134 percent since 1999 to 3,346, and more than 1,300 of those are considered “high-hazard”—meaning their collapse would threaten lives.

Traffic jams caused by insufficient infrastructure waste 4 billion hours of commuters’ time and nearly 3 billion gallons of gasoline each year.

A decaying transportation system costs our economy more than $78 billion in lost time and fuel each year.

You’re never going to be able to raise the gas tax high enough to provide the necessary funds. Meanwhile, there’s tons of private money ready to come in and participate all over the world. The United States is a laggard in this respect, which is ironic. Here in the land of innovation, we are absolutely backwards in this respect. I still believe, however, that plain business sense, coupled with the severity of the need, will finally make private investment in public infrastructure a much more common phenomenon in our country.

~ Mitch Daniels, Governor of Indiana

At the state and local levels, the majority of infrastructure is funded through state and local budgets (taxes and user fees) and financed in the municipal bond market. Increased federal mandates for social spending, balanced budget requirements and increased competition among states to keep taxes low have put the brakes on spending at the state and local levels, while debt limitations have constrained borrowing. As a result, state leaders find themselves with insufficient resources to meet the challenges they face.

Closing the current gaps will require raising additional revenue, reducing costs and finding new sources of finance with higher risk appetite. Given government restrictions on tax-exempt bonds and the political difficulty of raising taxes to secure new revenue in the current economic climate, a viable option for states is to engage the private sector in transforming existing assets and/or service provision and developing new capacity across the infrastructure landscape.

If infrastructure gaps are to be narrowed, the public sector must respond with solutions that can evolve with the changing environment. The old delivery models must give way to new, innovative models and a portfolio of hybrid approaches — from modifications in traditional procurement through to public-private partnerships.
Increasingly, governments around the world (including state and local governments in the United States) are turning to the private sector for some, or all of, the five basic elements of infrastructure projects: design, construction, service operation, ongoing maintenance and finance (see figure 4-2). Once rare and limited to a handful of jurisdictions and infrastructure sectors, these public-private partnerships (PPPs) have emerged as an important alternative model that governments are utilizing to improve project delivery and, in some cases, close a gap between infrastructure needs and the public sector’s capacity to address them. While the United States has been slower to adopt this trend, this is rapidly changing. More than half the states now have PPP-enabling legislation on their books, with states like Virginia and Florida particularly active in using PPPs.

Public-private partnerships are unlikely to fully replace traditional financing and development of infrastructure, but, for certain projects with the right characteristics, they offer several benefits to governments trying to address infrastructure shortages or improve the efficiency of their organizations. First, because the destination, not the path, becomes the

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4-2. The five components of an infrastructure project

**Design.** Under virtually any partnership structure, the responsibility for design will be shared. For instance, even in partnership structures with high degrees of private responsibility, the public sector’s articulation of performance specifications will limit the range of design options. In many projects, the need to ensure compliance with broader planning and environmental guidelines results in a significant degree of public sector design.

**Construction.** This component includes the construction of the physical asset(s) over a prescribed period of time, generally at a prescribed cost. Which party assumes the impact of construction cost overruns and time delays must be considered.

**Service operation.** Operating the asset may include various activities from general management of service provision and revenue collection to performing soft (or non-core) services associated with an asset, such as laundry services within a hospital. Operation typically begins at the end of construction, upon agreement that the construction has been satisfactory. In PPPs, the private partner’s compensation is dependent on the achievement of performance standards.

**Ongoing maintenance.** Generally, there are two principal types of maintenance to be considered in any infrastructure project: ongoing regular maintenance (or operation maintenance) and major refurbishment, often called life-cycle or capital maintenance.

**Finance.** This component generally includes financing for the capital costs of construction as well as working capital requirements.

Source: Deloitte Research
organizing theme around which a project is built, public-private partnerships enable the public sector to focus on the outcome-based public value they are trying to create. Second, PPPs transfer certain risks to the private sector and provide incentives for assets to be delivered on time and on budget, and to be properly maintained over time. Third, public-private partnerships can lower the cost of infrastructure by reducing both construction costs and overall lifecycle costs. Fourth, because the private sector is often willing to take on higher levels of debt and to provide upfront equity capital, public-private partnerships can allow infrastructure project delivery to be accelerated by years compared to traditional municipal bond financings. Finally, in addition to providing higher-quality infrastructure at lower cost, governments can use PPP transactions to unlock the value from undervalued and underutilized assets, such as land and buildings, and use those funds to help pay for new infrastructure.

Despite current challenges in the credit markets, private equity capital has continued to flow in the direction of infrastructure. Over the past several years, an estimated $190 billion has migrated to infrastructure funds globally, which could theoretically translate to more than $950 billion of leveraged purchasing power.67 It behooves government leaders to look closely at how to make limited public dollars go further by using private resources to narrow such bedeviling infrastructure deficits.

While PPPs offer significant benefits, formidable challenges abound. Lessons learned from PPP leaders worldwide suggest several strategies that foster success. First, governments need a clear framework for partnerships that confers adequate attention on all phases of a life-cycle approach and ensures a steady stream of potential projects. This can help avoid problems of a poor PPP framework, lack of clarity about outcomes, inadequate government capacity to manage the process and an overly narrow transaction focus. Second, a strong understanding of the innovative PPP models developed to address more complex issues can help governments achieve the proper allocation of risk — even in conditions of pronounced uncertainty about future needs. This allows governments to tailor PPP approaches to particular situations and needs. Third, a clear PPP procurement process and apportionment of final decision-making authority is necessary to ensure that private sector participants feel confident that the significant investment in preparing a bid will not be wasted by a broken procurement process. Last, an open, honest, direct and timely communication program with all affected stakeholders can be of critical importance, as PPPs can be politically controversial and difficult to execute in certain circumstances.

It is important to note that PPPs, while they may incorporate many of the tools of traditional public finance and procurement, are a new way of doing business, with the public and private sectors sharing and apportioning project risks over the life of the project. Without seeing these PPPs as true partnerships — not simply a different type of transaction — and adopting a tailored approach

“...To provide the kind of infrastructure that Americans need and deserve, we must find innovative ways of paying for it. One tool — private investment — must play a larger role in delivering projects. We must embrace the private sector to help leverage scarce federal and state dollars.”

~ Ed Rendell, Governor Of Pennsylvania
that suits the relative uncertainty and scale of each project at hand, governments are likely to make the same old mistakes. By using the full range of delivery models that are available and continuing to innovate — learning from failure instead of retreating from it — the public sector can maximize the likelihood of meeting its infrastructure objectives.

**ACTION PLAN FOR LEVERAGING PPPs**

Closing state infrastructure gaps will require innovation in service delivery and funding/financing models as well as forceful leadership from governors. The following strategies form the foundation of a balanced program to incorporate PPPs:

**Articulate the importance of infrastructure investment to voters**

Politically, the common characteristics of infrastructure — namely, that it is expensive and time-consuming to produce — can make public investment a difficult sell, particularly at a time when budgets are being slashed and popular programs are being eliminated. Yet, there are compelling reasons to invest in infrastructure that need to be articulated to constituents because of what is at stake for the U.S. economy. In particular, a series of large-scale investments over time are needed to modernize the foundation of the U.S. economy and to help the country keep pace with foreign competitors. An ample supply of well-maintained infrastructure is table stakes for competing in an increasingly flat world.

**Create a favorable legal climate for PPPs**

A key requirement for attracting private capital to infrastructure projects is to establish the necessary legislative and regulatory framework to support a successful PPP program, with clear processes, decision-making criteria and authority to execute transactions. With governments worldwide competing to attract investment capital, a poor legislative and statutory environment will stymie a state’s efforts to engage private firms in planned PPPs.
“We traditionally have looked at PPPs for the large projects with high price tags, where the state has a limited amount of money we’re looking to leverage. But we think there are also some great opportunities for PPPs among the smaller projects. And along with road projects, we think opportunities exist in our port, aviation and rail projects.”

~SEAN CONNAUGHTON, SECRETARY OF TRANSPORTATION FOR THE COMMONWEALTH OF VIRGINIA

The Commonwealth of Virginia has one of the country’s best PPP-enabling laws. Legislation has given the Virginia Department of Transportation authority to form contractual relationships by entering into partnerships with private sector firms and units of government and removed barriers to the formation of PPPs. The program also allows for fast-track study, design, funding and construction of state highway projects that are independent of the normal state procurement process. All in all, Virginia’s law creates a platform for constructing new transportation infrastructure projects that might otherwise be decades away or might not be constructed at all.

Create a strategic procurement and finance unit in each department with a significant capital program

In contrast to the development of a single cross-government unit with expertise specific to a particular procurement approach, these new department level units would be fluent in all the best approaches for procuring and financing infrastructure — from traditional procurement to public-private partnerships. Additionally, because the unit would be housed at the department level, staff would have the relevant sector expertise needed to account for the risks that are unique to each class of infrastructure (e.g. roads, prisons, wastewater facilities, schools, etc.).

Make full use of the wide range of delivery and funding/financing options available

Choosing an appropriate model requires understanding the broad range of delivery options available, including new, innovative PPP models developed to address more complex issues such as proper risk allocation. Any procurement decision should be derived from a robust appraisal of all the options, based on the specific circumstances in which a project is being developed. In addition, since the financial markets began undergoing

What works: Florida Department of Transportation’s “availability payment” model

In early 2009, the Florida Department of Transportation (FDOT) entered into a $1.8 billion 35-year concession with a private consortium headed by ACS Infrastructure Development to build and operate high-occupancy toll lanes near Fort Lauderdale. In this PPP, the FDOT will set toll rates, retain all revenues and make annual “availability payments” to the private concessionaire out of all of its revenues (including state appropriations, tax revenues and tolls). This structure is designed to retain as much public sector control over rate-setting as possible while also ensuring that the private concessionaire is incentivized to operate and maintain the road efficiently at the desired standard. The project represents the first U.S. toll road PPP structured with performance-based availability payments (see figure 4-3).
The California legislature has authorized regional transportation agencies and Caltrans to enter into an unlimited number of PPPs through 2017.

radical changes in 2008, the financing market for PPPs has seen significant evolution. Moving from a market primarily characterized by scarce equity capital and financings executed in the bank loan and project finance markets, recent transactions have included funding and financing from Private Activity Bond allocations, TIFIA loans, federal and state grants, ARRA money and equity from concessionaires, infrastructure funds and direct investment by pension funds. Flexible and creative use of funding and financing tools available to state and local issuers can provide lower costs of capital to a project and create more opportunities to deliver infrastructure.

**Adopt a full life-cycle perspective**

Diving head-first into anything without a proper understanding of what you’re getting into is usually a recipe for disaster. The same is true of entering into new partnerships. Governments need a full life-cycle approach (e.g., a clear framework) for infrastructure partnerships that confers adequate attention to all phases of the project — from policy and planning to the transaction phase, and then, to managing the concession (see figure 4-4).

**Roadblocks to overcome**

**Politics**

Political factors often determine the extent or nature of private sector involvement. For instance, the Commonwealth of Pennsylvania was unable to garner sufficient legislative support to enter into a concession agreement for the Pennsylvania Turnpike that would have raised $12.8 billion to meet other pressing transportation needs.68

**Goldilocks syndrome**

There can be a tendency in partnership structures to transfer either too much or too little risk to the private sector. For example, public sponsors often look to PPPs to save upfront or total project costs, sometimes resulting in too much risk being transferred to the private sector. Optimal risk transfer ensures that there are enough high-quality bidders to reap the benefits of robust competition and that the public sector does not “overpay” to transfer risk that it is better suited to retain (see figure 4-6).

**What works: Indiana toll road lease**

The Indiana Department of Transportation partnered with the Cintra-Macquarie venture to operate and maintain the Indiana Toll Road, paying the state $3.8 billion to lease the toll road over the next 35 years — a windfall of cash that’s being reinvested in the state’s 10-year “Major Moves” transportation plan. As a result, Indiana is one of the only states in the country with a fully funded transportation investment program.
4-4. Infrastructure project life cycle

Deloitte infrastructure life cycle

Deloitte “model” PPP program

Step 1: PPP framework development
- Develop and publish a PPP framework document that:
  - Lays organizational and project objectives for PPPs
  - Identifies key PPP constraints (legal, political, financial, practical)
  - Articulates expected PPP costs and benefits
  - Establishes a risk allocation philosophy
  - Establishes principles for a screening and prioritization methodology

Step 2: Project screening and prioritization
- Develop and implement specific screening and prioritization criteria for each type of asset
  - Should be implemented with available or easily collectible high-level data

Step 3: Strategic assessment
- Develop preliminary commercial / financial structures for high priority projects
  - Costing analysis
  - Risk analysis and preliminary allocation
  - PPP partnership structure analysis
  - Market soundings
  - Financing options analysis
  - Financial modeling

Step 4: Business case development
- Develop detailed business cases for projects that present the highest risk-adjusted expected value in the Strategic Assessment
  - Full Public Sector Comparator / Value for Money analysis, including detailed risk modeling
  - Procurement strategy development

Step 5: Procurement
- Execute procurement process
  - Commercial / financial structure finalization and preparation of suite of project documents
  - Tender document preparation and process execution
  - Bid evaluation
  - Conclusion of partnership agreement

Source: Deloitte
Partnering for value:
Determining the right mix of public and private involvement in infrastructure financing and delivery

All too often, public sector entities are unaware of the myriad available alternatives or of the considerations involved in selecting the most appropriate delivery models for their capital projects. This has resulted in less-than-ideal outcomes from traditional procurements and public-private partnerships alike.

The central question government leaders have to answer in order to address the longer-term issues associated with pursuing their infrastructure objectives is not whether to involve the private sector in infrastructure projects, but rather: What is the optimal mixture of public and private sector participation in any given project to maximize public value? There’s no one-size-fits-all answer for every situation. Most infrastructure projects are composed of five elements for which responsibility must be assigned: design, construction, operation, maintenance, and finance. Theoretically, any of these elements and their related risks can be allocated to either the public sector or the private sector. The shape of that allocation determines the structure of the partnership.

Dividing up these responsibilities in the best possible way for any given project is not easy. It requires careful qualitative and quantitative analysis. Short-cutting this process could result in suboptimal allocation and lost value. How, then, can public sector entities decide which project responsibilities they are best suited to retain, and which they are better off shifting to the private sector? Jurisdictions can determine the best mix of public and private resources for a given infrastructure project by following these three steps (see figure 4-5):

4-5. Determining the right mix of public and private involvement in infrastructure financing and delivery

Source: Deloitte Research
Step #1: Determine public authority
Exploring the laws and policies that exist regarding the involvement of the private sector in the financing and delivery of public infrastructure allows for the narrowing of the pool of potential partners. Furthermore, it ensures that the partnership won’t stumble on political constraints further down the road.

Step #2: Define project needs and objectives
Once a public sector entity has determined what it is permitted to do, the next step is to define the project goals. First, define the need. Then, define the service solution to meet that need. Lastly, policymakers must determine the asset(s) required to support the solution.

Step #3: Determine the best “owner” for each project component
Determining what you have authority to do and what you want to do will begin to narrow the options for structuring the relationship between the public and private sector. Then, sort out who can and should do what, using three basic criteria: 1) the in-house capabilities to deliver and/or manage, 2) the best financial options, and 3) how risks should be allocated between the public and private sector to maximize public value (see figure 4-6).

By applying a bottom-up approach to the development of a partnership structure, the public sector can deliver projects in a way that most closely approximates the optimal solution for any given jurisdiction. Careful, informed analysis at the outset of a project will help to ensure that limited resources are put to their best possible use, while putting government organizations in the best position to achieve their infrastructure objectives in today’s challenging climate.

Source: Deloitte Research
Virginia has achieved considerable success with public-private partnerships (PPPs) over the years in administrations of both parties. What has enabled Virginia to do this?

Virginia has a constitutional mandate that it have a balanced budget every year. That requires the state to look for ways to be innovative. Second, the state limits public debt to about 5 percent of general revenues. That makes state agencies look for ways to maximize revenues and look for private partners to take on debt and do projects on their own. Virginia is a pro-business state. We welcome the chance to get the private sector involved in our projects.

What are some of the key factors that have separated Virginia’s successes in the PPP space from its transactions that haven’t gone so well?

Over time, instead of actively and aggressively identifying PPP projects, we started relying on unsolicited PPPs. That has slowed down the process, because often, we have not done the necessary environmental and other studies, or preliminary engineering or scoping, or even thought about how to fund some of these projects. We’re refocusing our whole effort to incorporate the PPPs in our planning and programming, where we identify revenue streams to fund the projects. And then, we identify where we think a PPP makes sense and then solicit private partners.

Are there any specific types of assets and transactions where you see the most benefit in procuring under a PPP paradigm?

We traditionally have looked at PPPs for the large projects with high price tags, where the state has a limited amount of money we’re looking to leverage. But we think there are also some great opportunities for PPPs among the smaller projects. And along with road projects, we think opportunities exist in our port, aviation and rail projects.

For your HOT lanes projects in Northern Virginia, you’re using private activity bonds and also had the public sector take a real equity stake by sharing the upside. What broader lessons does it provide for other states?

This will be the first HOT lanes project that attempts to manage traffic flows as well as provide free service to car pools. We think this will be a model for other urban areas that wish to bring market forces to bear on transportation assets. We also believe that there are a lot of other places where we can do this in the commonwealth. Even on the free lanes, we would like to look for ways to manage the current capacity. We believe that the new operations center that Transurban is putting in place in Northern Virginia to manage the HOT lanes will become a test bed for how to get better utilization out of our existing free lanes.
Q. Are you considering in the future moving away from the gas tax toward, say, the use of more dynamic, GPS-based, per-mile pricing?

Even though we have more cars being registered in the state, and we have more vehicle miles being traveled, our gas tax revenues are going down. We think that’s due to the better fuel efficiency of newer vehicles, changes in driving habits and the impact of alternative fuels and electric and natural gas cars. These vehicles have the same impact on our transportation infrastructure as a gasoline-driven car, but they pay no taxes to support the system. We are looking at all the different options because in the long term, the gasoline tax is not a sustainable revenue source. I’m interested in how I can use technology to control traffic and get the most out of the current capacity.

Q. You have proposed a state infrastructure bank initially funded via sale of state liquor stores. Why do you believe the bank is needed?

We currently have a small, federally qualified state infrastructure bank, but we would like to establish a $1 billion infrastructure bank that does not use federal dollars and is not restricted by federal rules. It would be patterned on the TIFIA (Transportation Infrastructure Finance and Innovation Act) program at the U.S. Department of Transportation, but it also would enable us to lend money out and use the principal and interest payments to multiply into other projects. Then, we could lend out even more money and potentially provide guarantees or other techniques to leverage the first billion dollars three to five times. We think this is a great way for the government to multiply limited funds to get projects done and to provide credit during a period when it’s difficult for the private sector to do so.

Q. What other innovative things is Virginia doing?

We’re establishing a standalone PPP office to deal with PPPs in road, rail, transit, aviation and ports. We’re making it easier for our research programs to get the products of their research into our procurement system and our daily practices, setting aside $10 million to $20 million a year to provide incentives for using the results of our studies. We’re also looking into how to make sure that our Metropolitan Planning Organizations, which get federal funding, and the state are spending their money cooperatively, not in isolation from each other.

Q. Have you found innovative ways to reduce costs or enhance revenues?

We did an aggressive operational and performance audit, which found more than $1.5 billion in unused federal obligation authority, federal toll credits and cash buildups in our construction programs. We will put out on the street in the next six months $614 million more than we had originally planned, thanks to the money we found in this audit. In addition, we’re pursuing a transportation reform package in our general assembly that will update archaic regulations and policies. We’re proposing that our general assembly clean up these things to give us more flexibility to spend the money we have.

Q. Looking at transportation issues three or four years into the future, do you see any big game-changers on the horizon?

The first big issue is where the federal program goes. The second is how the ever-increasing efficiency of vehicles and the use of alternative fuels is going to impact the basic funding mechanism for the entire U.S. transportation program.

When the economy improves and trade increases, it will have a major impact on the transportation network around large ports in Virginia and elsewhere. I think the environmental issues are going to come storming back when the economy improves, so the ability to expand transportation facilities will become a major issue. And we’ll need to grow the intercity passenger rail systems that can move people into very heavily urbanized areas.