

Fixing America's Infrastructure: At What Cost?



A Material Problem

Public-Private Risk Sharing: Searching for a Win-Win

> A View From the Top Bridging the Gap

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The PBS&J Vision: Commitment to Our Clients Commitment to Our Culture and People Commitment to Our Company Commitment to Our Communities and Surroundings

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was editor, Kathe Jackson.

Kathe made a personal commitment to making PBS&J Highlights more than just another company publication and took its mission, to provide useful information on subjects related to a single topic of interest, to heart.

During her ten years at the helm, topics such as disaster preparedness and recovery, water issues, homeland security, management strategies, America's military, construction and environmental issues were covered. She laid the groundwork for what has become, arguably, PBS&J's most high profile communications tool.

It seems only fitting in this issue focusing on infrastructure that we acknowledge Kathe's dedication to developing a sound foundation for us to continue to build on as we proceed into the next decade and she moves on to lead Corporate Communications at PBS&J.

Fixing America's Infrastructure: At What Cost? on page 2, gives an overview of the declining state of America's infrastructure and the potential impact on the economy, and explores some of the innovative methodologies that can be *employed to avert future funding shortfalls.*

Rising construction material costs for infrastructure and the factors influencing these price increases are detailed in A Material Problem, on page 8.

How do you decide the level of risk you are willing to assume in a public-private partnership (P3)? **Public-Private Risk Sharing – Searching** for a Win-Win, on page 10, examines the factors that should be evaluated before making that challenging decision.

On page 12, A View from the Top provides some insight into the federal government's perspective on public-private partnerships and explores how they are implementing P3s.

Finally, **Bridging the Gap**, on page 14, discusses user financing and some of the ways this strategy is being used successfully to cover infrastructure funding deficits.

Infrastructure is something that impacts us all as we go about our daily lives. When it's functioning properly, we don't even notice it. When something goes wrong, we cannot help but take notice. For more on infrastructure, go to www.pbsjhighlights.com. You will find all of these articles, as well as additional features and information.

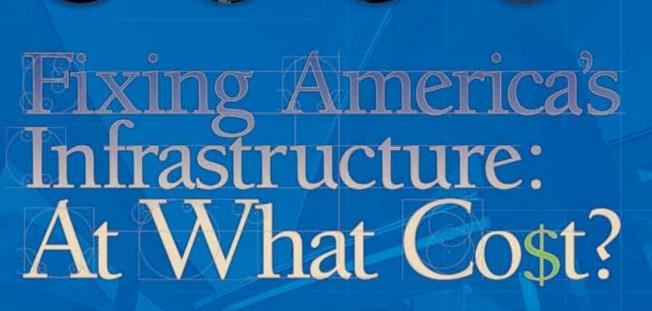






It was a little more than a decade ago, in 1997, that **PBS&J Highlights** *debuted a new, magazine-style format* and a new editorial direction for the then 18-year-old publication. Driving the changes and leading the publication into the new millennium





ook around America. You'll see the most impressive infrastructure of any nation on earth. Grand bridges, vast networks of power lines, giant dams, mileslong levees, communication towers, endless streets, unending interstates, and incredible plumbing under the ground. And think what these networks do:

• For pennies we can call anyone, anywhere, in this huge country.

• We enjoy a road network that connects every area of the country to major traffic arteries.

• The vast majority of our homes have telephones, televisions, plumbing, and easily traversed streets connecting them.

Sound infrastructure—roads, bridges, power grids, drinking water, wastewater, dams, transit, rail and aviation facilities-forms the backbone that is critical to maintaining

and enhancing economic growth, competitiveness, productivity, and quality of life. For many decades, it was America's infrastructure that gave her the competitive edge.

But the world has changed...or rather, aged. America's infrastructure is growing increasingly obsolete, putting America at a disadvantage in the evermore competitive global economy.

Our once-beneficial infrastructure is now the source of recurring catastrophes. The chart at the right details just a few of these noteworthy infrastructure failures.

"A modern economy needs a modern platform, and that's the infrastructure," investment banker Felix Rohatyn, co-chair of the Commission on Public Infrastructure at the Center for Strategic and International Studies, said in a recent New York Times interview. "It has

been shown that the productivity of an economy is related to the quality of its infrastructure."

In its 2005 Report Card on America's Infrastructure, the American Society of Civil Engineers (ASCE) gave updated grades to the country's infrastructure since it first assigned it a collective D+ in 2001. The ACSE's overall grade of D signifies little to no improvement. The bottom line: U.S. infrastructure is in sad shape, requiring more than a trillion and a half dollars over a fiveyear period to bring it back to a reasonably adequate condition.

Roads and Water

The ASCE estimates that poor road conditions cost U.S. motorists \$54 billion per year in repairs and operating costs—\$275 per motorist. Total annual spending of \$59.4 billion is well below the \$94 billion needed annually to improve transportation infrastructure conditions nationally.

The American Association of State Highway and Transportation

The Staggering Costs...



2003 2003 2004 2005 2005 2007 2007 The Silver Lake Dam in

Michigan failed, causing \$100 million in damage.

The City of Stockton suffered When Category 3 Katrina \$90 million in flood damage. Now sinking, undermined levees around the low-lying, fast-growing Sacramento/ San Joaquin River Delta in California leave hundreds of the past 150 years breached thousands of people at risk and threaten the viability of the state's drinking water system.

still recovering.

Officials (AASHTO) estimates that capital outlay by all levels of government would have to increase by 42 percent to reach the cost-to maintain level, and by 94 percent to reach the \$125.6 billion costto-improve level. In contrast, the Federal Highway Administration estimates that outlay by all levels of government would have to increase by 17.5 percent to reach its projected \$75.9 billion cost-to-maintain level. and 65.3 percent to reach its \$106.9 billion cost-to-improve level. When it comes to water, America faces a shortfall of \$11 billion annually to replace aging facilities and comply with safe drinking water regulations. Unless the nation invests nearly \$1 trillion over the next two decades in drinking water and wastewater upgrades alone, we face the risk of reversing the public health, environmental, and economic gains of the past three decades.

Who Pavs?

The reality is we all pay for infrastructure in one way or anotherthrough income and property taxes, fuel taxes at the gas pump, tolls or transit fares, surcharges on our electric bills, monthly water consumption fees. But the big dollars needed to repair our crumbling systems are beyond the budgets of local and state governments. More sobering, the bill has become too large for the federal government.

Take transportation, for example. Our interstate roadway system was planned more than 75 years ago, and the mechanism devised for its dependable funding, the Highway Trust Fund, was created by the Highway Revenue act 51 years ago.

About 45 percent of all highway spending comes from the trust fund, which gets its money mainly from the 18.4 cents-a-gallon excise tax that drivers pay at the pump. Of this, about 15.44 cents goes to the highway trust fund, 2.86 cents to mass transit programs, and one-tenth of a cent to a leaking underground storage tank fund.



tial storm but not the worstcase hurricane. Even so, and overflowed. The city is



On July 18, an 83-year-old hit the Louisiana coastline in steam pipe erupted in midman and causing

millions of dollars in lost levees built and patched over business. Indeed, New York has endured several recent pipe explosions. In 2000, one River below. explosion near Washington Square blew a 15-foot crater in the street, and another in 1989 killed three people and hurled mud and debris into the air.

On August 1, the entire span of an interstate bridge in August, it became a substant town Manhattan, killing one Minneapolis collapsed during evening rush hour, killing six people, and sending vehicles, tons of concrete, and twisted metal into the Mississippi

...Reach Across the Infrastructure

ASCE's assessments make clear the costs of neglect.



Transit. Higher bus and subway fares and service cutbacks can't make up for funding shortfalls to maintain tracks and trains. Intimidating construction costs discourage new projects and major improvements. Mass transit links are lacking, strangling road access at peak travel times. Congress estimates that \$14 billion in annual capital infusions will be needed to keep pace with developments.



Airports. U.S. 21stcentury airports resemble 20th-century bus stations. New jumbo jets call for reengineered runways.



Rail. High-speed rail is one solution to our pressured roadways. Experts agree that highpopulation regional corridors need passenger trains. The U.S. will need to spend at least \$250 bil-



Dams. Engineers have identified 3,500 unsafe dams, a number that is increasing at a faster rate than those being repaired. \$10.1 billion is needed over the next 12 years to address all life-threatening, non-federal dams. The total investment needed to bring all 79,000 dams nationwide be added will be only oneinto safety compliance totals \$30 billion.



Power Grids. Existing transmission facilities were not designed for the current level of demand, resulting in an increased number of "bottlenecks" that increase costs to consumers and elevate the risk of blackouts. During the next ten years, the line-miles of transmission projected to third the rate of electricity demand. In addition, maintenance expenditures have actually decreased 1 percent per year since 1992.

Gasoline was only 30 cents a gallon and the excise tax on it was just three cents in 1956 when Congress created the fund. Now, decades later, interstates are reaching the end of their typical 50-year life cycles and require expensive rebuilding or revamping. As gasoline prices rose during the interim, so did the tax. But a tax-adverse Congress has kept it at 18.4 cents per gallon since 1993, when gasoline prices were about \$1.10 a gallon. Today, the gas tax is less than one-half of 1960 levels, adjusted for inflation.

At the end of 2000, the Highway Trust Fund had a balance of almost \$23 billion. By the end of 2006, that balance had fallen to \$9 billion. Between inflation and improved fuel efficiency, federal tax dollars are disappearing. The **Congressional Budget Office predicts** the fund will run a deficit of \$1.7 billion at the end of 2009 and \$8.1 billion by the end of 2010, when the current highway program expires.

In its report on global infrastructure, the Urban Land Institute states that this scenario extends to other forms of aging infrastructure, especially in cities built early in the last century or before. Deferred maintenance leads to greater capital costs with the burden placed increasingly on local governments. The federal government just won't pitch in anymore—"no new taxes."

lion over the next 20 years

to catch up to Europe's and

Asia's model systems.

So, the real question emerges: how will we pay?

Alternative Funding Mechanisms

Traditionally, government agencies raise capital for new construction through public bonding. This approach spreads the debt over the useful life of the asset and delivers infrastructure when it's needed. The beneficiaries of the capital investment pay the up-front bill. Potentially high borrowing rates, limited future budget flexibility, and pushing the debt service onto future generations are the drawbacks of this vehicle.

Another alternative, tax increment financing (TIF), started in California in 1952. TIF uses future gains in taxes to finance current

improvements that will create those gains. When a public project is carried out, there is an increase in the value of surrounding real estate, often accompanied by investment in new or rehabilitated buildings. This increased site value creates more taxable property, which increases tax revenues. The increased tax revenues are the "tax increment," which is dedicated to finance debt issued to

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pay for the project. Many localities use TIF bond proceeds as a primary source to pay for new infrastructure to attract developers and commercial enterprise.

Every U.S. state, except Arizona, has passed enabling legislation for TIF. Proponents say that TIF is a lifeline for local governments reluctant to raise property and sales taxes in the face of substantial declines in federal grants and subsidies. On the plus side, owners of properties who benefit directly from infrastructure improvements pay for them over time in higher tax assessments. On the downside, bond holders carry the risk that tax assessments don't cover debt service, and local governments need to be concerned about the impact of potential defaults on their overall credit ratings.

Impact Fees

Impact fees are paid by developers out of their own pockets. Local governments increasingly are requiring them for infrastructure extensions and improvements into non-TIF projects, especially new developments. Since builders add this to the sales price, they lose the money if projects don't sell.

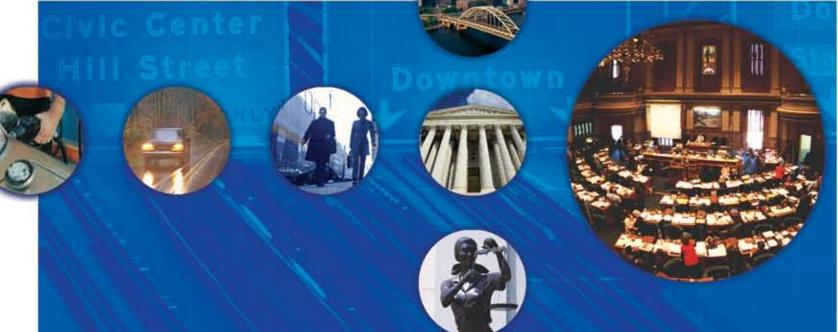


These funding alternatives have a drawback: they do not pay for maintenance or repairs of infrastructure systems after they are built. Those costs typically must be covered by property and sales tax revenues raised by the county or municipality.

Following the Leaders

While America can claim first place in many of life's arenas—business, lifestyle, pop culture, technology—it is not a world leader when it comes to finding infrastructure financing solutions. Other countries are leading innovation.

Margaret Thatcher pioneered the public-private partnership concept in the '80s with the privatization of Britain's water facilities. Publicprivate partnerships (P3s) typically rely on long-term contractual relationships between government agencies and private-sector partners for the provision and operation of an infrastructure asset. P3s are now being used to deliver new and refurbished roads, bridges, tunnels, water systems, schools, defense facilities, and prisons.





Today, close to one hundred P3s projects are initiated or completed annually in Britain. In India, \$47.3 billion is scheduled to be invested in highways alone over the next six

years, 75 percent of it coming from public-private partnerships. Japan has 20 new P3s projects in the pipeline. In Europe, the volume of P3s deals is doubling, tripling, and even quadrupling year to year in many countries, according to a Deloitte Research Study on public-private partnerships.

Tolls and the Privatization Wave

"Toll roads were here before the interstate trust fund," says PBS&J's Tom Delaney, associate vice president & division manager, national tolls technology. "In fact, the interstate highway was originally planned as a toll road. When the alternate scheme for gas-tax funding was accepted, the issue of maintenance wasn't adequately addressed. Operational funding was left up to the states."

In 2005, the passage of the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU), gave tolling a boost, since it allowed, with certain restrictions, tolls on existing interstate facilities. Spurred by rising congestion, lack of federal funding, and better toll collection technology, 32 of 50 states now operate or are considering toll roads. Even so, Delaney notes, revenue is not growing proportionate to costs and operators can't address immediate needs.

Faced with these pressures and strapped for cash, in 2005 Chicago became the first U.S. municipality to mimic its European counterparts in entering into a public-private agreement for the operation of the Chicago Skyway.

"Spanish tollway concessionaire Cintra, with the Australian bank Macquarie, won the first major 'brownfield' [existing facility] concession deal in North America in early 2005 with the Chicago Skyway," says Phil Miller, a PBS&J tolls project director who worked with his colleague David Burgess to provide a brief due diligence review of the legacy toll system. The Chicago

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Skyway lease provides Cintra and Macquarie's operating company a 99-year toll concession for the lease period in exchange for a one-time, up-front payment of \$1.8 billion, Miller noted.

Perhaps even more noteworthy is the subsequent leasing of the Indiana Toll Road in June 2006. The Governor of Indiana used the concession bid process to raise money for a \$2.7 billion, 10-year program for a major improvement of Indiana highway infrastructure by offering a 75year lease of the 156-mile interstate toll highway between the Chicago Skyway and the Ohio Turnpike.

The Cintra-Macquarie team was again successful. "The team submitted the winning bid of \$3.85 billion for this concession, which easily met the Governor's funding needs, while also providing for extra local-roadsfunding for the counties impacted by the toll road lease," explains Miller. Not only is Indiana the only state with a 100 percent-fully-funded, longrange capital program for highways, but the state of Indiana is also earning interest on this "transportation endowment," which can fund further transportation improvements.

States Embrace P3s

These two deals opened the floodgates. More than half the states now have P3s-enabling legislation on their books. Texas, Virginia, and Florida have been especially active. Texas is relying on this approach to develop the Trans Texas Corridor, a massive new statewide transportation network that includes roads. commuter and freight rail, and utilities infrastructure. Virginia is negotiating P3s for several new projects, including the Dulles Rail Corridor, high occupancy toll lanes, and reconstruction of tolled truck lanes. The Commonwealth of Pennsylvania is conducting a bid process for a concession to operate the 560-mile, 67-year old Pennsylvania Turnpike. Estimates coming from all quarters peg this deal at a potential of \$12-\$18 billion, or perhaps more.

PBS&J Highlights

"Not every project should be a P3," asserts Vic Poteat, PBS&J national toll practice director. "If a public agency has the bonding capacity and resources to deliver a major project and remain within its debt parameters, then that may be preferable. However, many projects, because of size and complexity, would come out ahead with private participation."

Successful P3s, he says, can offer benefits such as: on-time/withinbudget delivery; shifting construction, maintenance and operations risk to the private sector; lower construction and reduced life-cycle maintenance costs, and lower costs of associated risks; accelerated infrastructure construction; enhanced customer service orientation; and freedom for the public sector to focus on outcomes and services rather than the processes of construction and maintenance.

Enlightened Tolling

The attractiveness and popularity of toll road investments have been enhanced by the willingness of state legislatures and public authorities to recognize the need for periodic toll increases to keep up with inflation.

Traditionally, state legislatures and toll authorities often let tolls remain unchanged so long as receipts covered existing bond repayment obligations and current operating expenses. Now, inflationindexed tolls, first introduced in the long-term concession agreements for the Chicago Skyway and Indiana Toll Road, and recently adopted in Florida by legislation, will allow future toll roads to be placed on a more businesslike basis.

Contributing to the public sector's embrace of tolling has been the agreement by private toll concessionaires to accept availability payments and toll revenue-sharing as methods of compensation. From the government's perspective, these arrangements have several advantages over outright concessions.

An Array of Alternatives

Although there are thousands of P3s in operation around the world, "there's no 'standard' way of going about this," explains Phil Miller. "P3s are complex endeavors that have a lot of components. You can't know how to structure one until you get into it." With that said, the Federal Highway Administration enumerates some current configurations. The list provided generally moves from one extreme of ownership and control to another. The first models provide more direct and clear control and ownership in the public sector; the latter ones shift the day-to-day rights and responsibilities of ownership, including revenue risk and operations risk, to the private sector.

• Private Contract Fee Services/ Maintenance Contract	 Build-Operate-Transfer (BOT) or Build-Transfer-Operate (BTO)
• Construction Manager at Risk (CM@R)	• Build-Own-Operate (BOO)
O Design-Build (DB)	• Transit-Oriented Development (TOD)
O Design-Build with a Warranty	○ Joint Development Agreements (JDA)
• Design-Build-Operate-Maintain (DBOM)	• Multimodal Partnerships
• Design-Build-Finance (DBF) or	○ Long-Term Lease
Design-Build-Finance-Operate (DBFO)	Agreements/Concessions

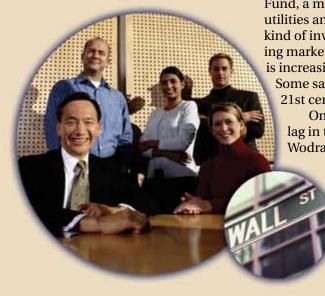
They allow the state to retain the toll revenue—an arrangement that is politically more defensible than letting a private concessionaire keep the toll proceeds. Second, by tying payments to the volume of traffic, the state creates a profit incentive for the private concessionaire to manage the facility efficiently and attract a maximum number of customers. Third, the state owes money to its private-sector partner only to the extent the facility generates revenue. If traffic is lower than forecast, the private partner bears the risk.

Enter the Bankers

The growing acceptance of automatic toll increases is a key reason for the latest development in infrastructure funding: investment by private capital markets. Awash in cash—some estimate \$100 billion-global investment banks, private equity firms, and institutional money managers are looking to place money from pension funds, insurance company general accounts, and high net-worth clients in infrastructure investments—the new "asset class."

Multibillion-dollar CalPERS, the nation's largest public pension fund, may have been the harbinger of the new mind-set when it announced in September 2007 that it was creating a \$2.5 billion pilot infrastructure program focusing on investments in new roads, bridges, airports, and other utilities.

"The two biggest markets in the U.S. for infrastructure investment are





transportation and water," says Vic Poteat, "because they are big, stable facilities that will always be needed by the public. Therefore they give investors exactly what they want: long-term investment vehicles with stable returns."

In its report on global infrastructure, the Urban Land Institute quotes bankers commenting that "the best opportunities for mature assets are in North America" and "the U.S. has to do something—they have a need and there is capital demand." With legislation enabling private market investment in infrastructure in 28 of the 50 states, U.S. markets

are receptive.

John R. (Woody) Wodraska, national director of water resources at PBS&J, adds to that observation: "Toll roads are initially the more attractive investment. There are more toll roads being built than private water systems, and investors chasing big returns can get, maybe, 14 percent. But toll roads depend upon users, who may cut usage when the cost of gas rockets. On the other hand, people always need water. So while investment in a wastewater plant may yield 8-10 percent, that return is incredibly consistent, even in bad times."

21st century."

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Wodraska and PBS&J assisted AIG in their AIG Highstar Capital Fund, a mutual fund focusing on utilities and infrastructure. "This kind of investment is the emerging market," he says, "where water is increasingly on everyone's mind. Some say Water is the Oil of the

> One of the reasons for the lag in the water arena, says Wodraska, is that "water captures



a different emotion from transportation. We drive on roads when we need to, but water is something we drink every day. It affects our kids. Privatization has such negative connotations that when dealing with public health, we don't want a costconscious private provider. On the other hand, we know how inefficient the public sector can be. The bankers have the freedom to be creative on the transportation side. Whoever figures out the right financing vehicle for water investment will be the big winner. We're waiting for that next best thing."

Possibly all of our government officials, knowing the staggering costs needed to repair the networks that support society, and the impossibility of raising these sums in the near future, are hoping too for the one magic solution. Of course, there is none. With emerging powers like China-which spends 9 percent of its gross domestic product (gdp) on infrastructure-and India-which budgets 3.5 percent (\$25.5 billion) while aiming to increase its allocation to 8 percent—upping the demand for the raw materials of construction, costs will only continue to rise. Most experts agree that the real fix for America's crumbling infrastructure-for which we budget \$112.9 billion or just 0.93 percent of our gdp-comes down to reassessing how we design our communities and transport our people. While we need new financial tools, we also need to look at new social paradigms. In the meantime, our infrastructure is ailing, and people are hard at work figuring out how to help it recover.

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MATERIAL
PROBLEMConstruction Material
to Increase as Infrast
Continues to Decline. Construction Material Costs Continue to Increase as Infrastructure Funding

n a traditional Design-Bid-Build (DBB) scenario, one of the key factors affecting risk and project budget is the cost of construction materials. Once fairly easy to estimate, it is becoming increasingly difficult to predict long-range construction costs without a crystal ball because of the wildly fluctuating costs of construction materials. This is one of the factors driving the transition to alternative delivery systems such as Design-Build-Operate (DBO) and Concessions.

According to industry analysis conducted by the Federal Highway Administration, American Association of General Contractors. and the American Road and **Transportation Builders Association** (ARTBA), since 2003, prices for asphalt, concrete, steel, and lumber have "gone through the ceiling," resulting in a Construction Cost Index (CCI) increase of approximately 59 percent from 147.8 to currently over 250. The table depicts price variations for four major construction materials over the past six years, and how those variations have impacted the CCI.



One of the single largest factors influencing the cost of construction materials is the rising cost of petroleum. Petroleum cost has a particularly significant impact on petroleum derivatives like asphalt. In 2003, petroleum was selling for \$23 a barrel. By 2005, the price per barrel had more than doubled to \$60. As of press time, petroleum prices are currently hovering around \$100 per barrel. Accordingly, related pricing increases, not only for petroleum derivatives, but for associated costs such as the transportation of construction materials from source to site making the cost of all construction materials more expensive. Petroleum prices, however, are not the only factor influencing the rising cost of construction materials.

Dan Reagan, senior transportation group manager in Austin, Texas, explains that "Beginning in 2004, the four Florida hurricanes and Hurricanes Katrina and Rita in 2005, created so much infrastructure devastation that the increased demand for construction materials from these events alone would have caused significant price increases in the U.S. The recent fires on the West Coast will only add to that pressure."

It's not just national events that impact the price of key construction materials. World events also make a significant impact on material price escalations. According to the World Bank, China recently embarked on the Inner Mongolia Highway Project, which includes construction of the Laoyemiao-Jining highway (LJH) — a divided four-lane, access-controlled

Year	Lumber	Cement	Steel	Asphalt	CCI
2002*	100	100	100	100	147.8
2003	100	100	105	102	142.8
2004	130	105	140	105	150.9
2005	115	112	162	112	196.4
2006	118	128	179	140	231.9
2007	105	135	185	158	250+

Source: Federal Highway Administration, American Association of General Contractors and ARTBA. *These are not unit prices but index numbers of the percentage increase in subsequent years over the base year of 2002.



the national highway network, will connect the key industrial, administrative, and hub cities of Baotou, Hohhot, and Jining. China's goal is to develop 52,000 miles of roadway by 2020 connecting all cities with populations over 200,000¹.

Meanwhile, the National Highways Authority of India was mandated in 2000 to implement the National Highways Development Project (NHDP), India's largest ever highways project. The project, to be completed in phases over the next two decades, involves upgrading nearly 40,000 miles of highway that serve as the arterial network of the country with significant capacity and safety increases. The Cabinet Committee on Economic Affairs (CCEA) approved funding in 2006 for Phase VI of the project, which is still in progress.

Europe has also implemented the TEN-T plan to expand more than 10,000 miles of infrastructure. All of these large scope, multiyear projects fuel the demand for construction materials.

So what does all this mean to those in the construction and engineering community who are already paying more for the same amount

¹ARTBA "Critical Commerce Corridors." November 2007

even private entities are feeling the financial pinch and cutting back on construction work. Cutbacks can ultimately lead to fewer design, construction, and management jobs, causing an increase in competition as more companies scramble for fewer opportunities. It also means that those companies that are successful in securing work, will need to be more conscientious in controlling costs and finding innovative ways to fund projects when traditional funding is no longer available.

It's not all gloom and doom, however. The recent downturn in the housing market and continuing slump in homebuilding are reducing the demand for materials such as lumber and concrete. As we continue to get closer to completing the rebuilding process in the wake of the 2004 and 2005 hurricanes, demand for construction materials will continue to decrease and prices should begin to stabilize. But the fact remains, as long as global demand outpaces the availability of resources, rising material prices will continue to plague the future of our infrastructure. 用

For every unit of cement (bag or ton) used in the United States, India uses three and China uses five. The good news is that production in China, the world's largest cement producer, has been increased to match what they are using domestically, reducing reliance on imports. And production in the U.S. is beginning to increase as well.

Source: Portland Cement Association Chicago, Illinois

PUBLIC-PRIVATE RISK SHARING: SEARCHING FOR A WIN-WIN

The U.S. is seeing a growing trend in the use of publicprivate partnerships (P3s) for the delivery of transportation infrastructure through an infusion of infrastructure funds into the revenuestrapped public infrastructure market. The Federal Highway Administration defines a P3 as "a long-term partnership arrangement between a government agency and a private sector party...resulting in the private sector party providing public infrastructure and/or services that are traditionally delivered by the public sector." P3s, in their most basic form, are a mechanism for a government sponsor/partner to shift project-related risks to the private partner/investor.

While discussions of the P3 delivery model tend to focus on the "bottom line" potential, few understand one of the basic motivators behind a successful P3 project: the appropriate sharing of risk.

Understanding **Shared Risks**

The use of various P3 delivery models brings to bear the ways in which risks can be shared between public and private entities. A key objective of a P3 is strategic distribution of risk to maximize the benefit to the public—otherwise known as the Value for Money (VFM). Distribution or allocation of specific risks between public and private partners is primarily determined by the rule of control: the risk should be allocated to the party best able to control the risk; if neither party is able to control a risk, then the risk should be shared.

The traditional infrastructure delivery model is usually referred to as a Design-Bid-Build (DBB) process. In the DBB process, the public

agency assumes all risks with the exception of actual construction risks. **Construction risks** are assumed by the

private constructor in lieu of a payment for delivering the project. By contrast, in a full Concession delivery approach, the private entity assumes the largest percent of project delivery, financing, revenue, operation, and maintenance risk.

General protocols for determining and assigning risks include:

• Term of the contract: a private investor may be more liberal in accepting a specific risk as influenced by the term of the contract—longer term contracts equate to a higher probability that a risk event will occur.

• Type of revenue: A private investor may be more liberal in accepting a specific risk as influenced by the type of revenue—a user fee contract has "revenue upside" as compared to an availability payment contract that has no or limited upside.

• Timing of the risks: A private investor may be more liberal in accepting a specific risk as influenced by that risk's timing—a risk that could occur during the construction period (three years) has fundamentally a lower probability of occurrence than a risk that could occur during the service period (35 to 50 years). Another key understanding with respect to the timing of risks

is that during the term of the P3's contract, the private risk profile changes; risks drop away as time goes on. Variations

in the risk regime are



driven by the following considerations: • Greenfield or Brownfield project

• User Fee or Availability Payment project

• First time or mature public agency sponsor

• State P3 legislation level of detail • Specific objectives of the P3

program

• Type of project—new asset or rebuild, toll road, or managed lanes

Achieving a Win-Win

The success of any P3 agreement is contingent upon having an alignment of interests and a solid contract for delivery of the project between the public and private entities, regardless of the model to be used. Among the keys to this success are:

• Public entity identification of the project's value/need and clear communication of the value/need to potential private entities

• Well-defined services and products to be achieved by the private entity

• Use of transparent and commercially acceptable regulatory and procurement processes

• Clearly defined transfer of risks from the public to the private entity along with the ability to undertake steps

to manage and address those risks



· Identification of a real, incremental economic advantage of a P3s as compared to the traditional in-house governmental option, otherwise known as VFM

• Political will to maintain the course of the procurement and implementation processes

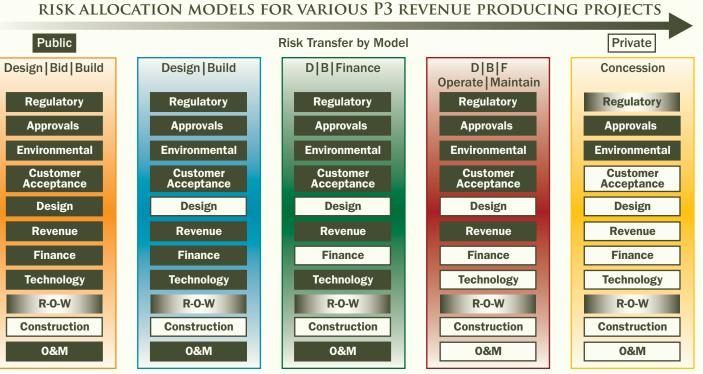
The successful P3 does not happen without overcoming challenges, which may typically include:

• Selection of the right project and continued political will and support

• Need for complex structure and deal documents that clearly define parameters

• Adequate time to arrange agreements and understandings

• Willingness by both parties to commit to high up-front costs • Demand of significant senior staff time from the public agency Today's infrastructure market is complicated and growing in complexity as qualified private entities vie for roles typically assumed by public agencies. The transfer of risk from the public agency to the private entity is a critical consideration in a public agency's strategy to become involved in public-private partnerships. Understanding these relationships can result in better projects and the long-term alignment of interests for the benefit of the public.



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The graphic below depicts the shift in risk areas among various delivery models. Areas of risk are summarized for each major portion of project delivery, from project initiation through construction and operation. Those areas highlighted in a darker color represent those risks assumed by the public agency. Those areas highlighted in the lighter color represent those risks assumed by the private entity. Those areas shaded in both colors depict risks shared by both the public and private entities.

Moving from left to right, the delivery models show a greater assumption of risk by the private entity and additional shared risks between the two entities.

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Federal Agencies Partner

to Build Consensus

and Facilitate Progress

as Budgets Tighten.

fiscal year 2009. The funding crisis, believed to be a product of hybrid vehicles requiring less fuel, cars getting better gas mileage, and Congress simply underestimating the need, has been intensified by local interests and earmarked projects, hampering the effective use of federal funds. Earmarked projects (projects

In fact, the Federal-Aid Program will be reduced by \$16 billion for

allocated by Congress for development) have resulted in an inequitable distribution of monies from the HTF to states. The distribution of funding based on considerations such as interstate lane-miles and population, falls short as earmarked projects become the primary focus at the local level, obligating states to take up the funding slack until completion, essentially reducing remaining funds for maintenance and development of other necessary infrastructure. Many of these earmarked projects have received intense scrutiny such as Alaska's Bridge to Nowhere making the biggest headlines with \$320 million allocated in three different earmarks to build a bridge from the town of Ketchikan (population 8,900) to the Island of Gravina (population 50) where the airport resides. Many feel that only a few constituents will reap the benefits of these appropriations at the expense of other states that could benefit from wider reaching bridge and roadway repair and maintenance.

Federal Solutions: Making up the Difference

With congestion throughout the United States continuing to grow, costs rising and funding at a premium, the five-year SAFETEA-LU budget did establish some programs supporting public-private partnerships (P3s) to offer more economical and efficient delivery options for transportation projects.

As a way of stimulating use of these newly authorized P3 programs, in 2006, the United States Department of Transportation (USDOT) requested that its state partners submit multi-state applications for designation of interstate segments as "Corridors of the Future." For example, the Virginia, North Carolina,

South Carolina, Georgia, and Florida Departments of Transportation teamed to successfully apply and were selected for funding for a "Corridors of the Future" project. One of only six projects selected throughout the country, the I-95 corridor from Washington D.C. to Miami, Florida, will receive \$21 million in funding for "congestion reduction and mobility improvements." A key component to this award was the willingness of the I-95 corridor partners to include private sector investment in future corridor expansion and improvement projects. Other discretionary programs within the SAFETEA-LU budget include the Highways for LIFE Technology Partnership Program, introduced in March 2007, to bring about innovation in highway projects through the use of state-of-the-art technologies, elevated performance standards, and new business practices in highway construction. Grants are awarded to partner organizations and companies with the goal of achieving at least one of the following: Improve project or work zone safety (including worker or user safety) Reduce construction congestion • Accelerate construction or

improve quality

It is the intent of the program to enhance existing highway systems or introduce proven innovations from other disciplines that could be adapted to the highway industry. More recently, to combat the financial shortfall, the FHWA has issued some revisions to the Code of Federal Regulations to allow states and agencies to issue design-build request-for-proposal documents, award long-term concession contracts, and issue notices-to-proceed

hink globally, act locally, is the mantra that has driven the environmental movement for several decades. The concept is simple: what can you do at the local level that will affect the greater good? It's a concept the Federal Highway Administration (FHWA) is taking to heart as it seeks to support both federal and state transportation projects in meeting efficiency, effectiveness, and deliverability throughout the United States, the District of Columbia, and five U.S. territories (American Samoa, Guam, the Northern Marianas, Puerto Rico, and the Virgin Islands). Striking a balance between easing the movement of people and goods throughout the nation by connecting states with new highways, railways, and ports while keeping pace with steadily decreasing funding at both the local and federal levels is no easy task.

A View from the Top

The FHWA's available funding comes through the Federal Highway Trust Fund (HTF). Created in 1956

to help finance the development of interstate highways and later mass transit projects, the HTF is predominantly funded by a federal fuel and diesel tax. Some additional monies are generated from truck-related taxes on tires and highway usage. The upside of this arrangement is the FHWA has significant input into where transportation projects will get built. The downside, unfortunately, is a major shortfall in available funding.

In 2005, the United States Congress passed the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU), which established the current five-year, \$286.4 billion budget for funding transportation infrastructure. However, with a constant demand for new and improved transportation infrastructure and steadily rising construction material cost, unless Congress takes definitive action, the HTF will not be able to support the current program through 2010 as originally anticipated.





for preliminary design work prior to the conclusion of the National Environmental Policy Act (NEPA) process. The rule change further levies more support for P3s relationships.

In an August 16, 2007, U.S. Department of Transportation press release, FHWA Administrator, J. Richard Capka, discussed the benefits for tax payers in the rule changes. Capka commented, "Innovative contracting leads to speedier project delivery. The new rule will help to mainstream the approach and reduce the costs for states wishing to enter into public-private partnerships."

Some say the obvious answer to funding shortfalls would be to eliminate local earmarks while focusing on other options, like partnerships, to complete larger transportation projects benefiting the most tax payers. But it is not that simple as Susan Binder, the FHWA's Director of the Office of Legislation and Strategic Planning pointed out in a recent interview.

"Unfortunately, the transportation industry goes beyond political boundaries, and your trip from A to Z does not start with a single mile marker," Binder said. "We need to develop all aspects of the nation's transportation infrastructure by rethinking in a modern economy and using innovative financing to help us get this done."

If federal and local transportation agencies are to address the growing demand to reduce congestion through new or enhanced infrastructure, it is clear that a consensus must be reached-or at least soughtwhen funding transportation projects in the U.S. Public-private partnerships offer one method for reaching that elusive goal. **H**

bridging

User financing is one of the innovative ways local and state leaders are bridging the gap between dwindling federal funding and rising infrastructure costs.

hen Spanish-controlled Cintra (Grupo Ferrovial) paid billions of dollars for a 99-year lease on Chicago's Skyway, the city's actions were simultaneously hailed as ingenious and treasonous. Are we selling out America to foreign countries simply to fund infrastructure?

For tolling and transportation, some states have invented creative financing alternatives. The North Carolina Turnpike Authority (NCTA) has several projects currently under consideration, which may be funded using a combination of tolls and TIFIA loans. However, even with this combination, North Carolina may possibly face a \$200 million funding gap. One creative approach to fill it is through subordinate debt. "This is somewhat like a publicprivate partnership (P3), but NCTA would still run it," explains David Burgess, PBS&J senior ITS analyst

and consultant. "With subordinate debt, the loan becomes subordinate to all other debt incurred." NCTA received numerous responses to its request for expressions of interest (RFEI) for subordinate loan funding options. Upon selecting a suitable option NCTA will issue a Request for Proposal (RFP) for the funding.

Florida is one of the fastest growing states in the nation and has faced many challenges in funding infrastructure projects. Rising construction costs, Right-of-Way (ROW) costs, and lack of contractor availability have been some of the greatest challenges. In Seminole County, voters approved a ten-year, penny-sales tax initiative to address capital improvement needs—mainly schools and transportation—not once, but twice.

When compared to other means of raising revenue, such as a gas tax, "[the sales tax] actually generates





\$60 million annually in revenue, compared to a gas tax, which would have generated approximately \$1.2 million annually," explains Pam Hastings, Seminole County public works administrator.

Proactive planning and smart spending in this second generation sales tax will save taxpayers money in the future. "The ability to expand, if necessary, is available without having to acquire more ROW," said Gary Johnson, Seminole County public works director.

Florida's Turnpike Enterprise (FTE) has earned a reputation as a leader in building transportation infrastructure. In 2002, Florida's state legislature challenged FTE to prove that a government agency could manage public assets using best private-sector practices. Primarily financed through its toll and concession revenues, the Turnpike is proof that user financing for tolling/transportation infrastructure is

a viable option. In 2007, the legislature passed House Bill (HB) 985, increasing the Turnpike's bonding capacity to \$10 billion and including a provision that allows annual toll rate indexing to the CPI (no less than once every five years).

Sustainable Water Infrastructure

Water is not a commodity; it is a basic necessity of life. A recent press release stated that studies "estimate the funding gap for this critical infrastructure at [\$300 billion to] \$500 billion over 20 years" (Water Industry 2007).

Although the government has been a major financial contributor in the past, that role is changing. Unlike transportation, the water industry may not be suited for private ownership. The questions then become: What is the future role of federal government, and how do we finance

improvements to existing infrastructure and build new infrastructure? Some communities are devising innovative financing to build new facilities or retrofit existing ones. The City of San Diego is one example. Using public-private financing for the expansion of its methane production facilities, the use of methane as an alternative energy source is a "green" project for two main reasons: it saves money and it saves the envi-

The City of Seattle implemented a Design-Build-Operate (DBO) approach to develop a water filtration plant. As John R. (Woody) Wodraska points out, "Communities are looking to consultants for answers to the question: how do we pay for this? Alternative delivery systems such as DBO and DBOT (Design-Build-Operate-Transfer)



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are a way for the public and private sectors involved in the project to ultimately negotiated a contract for a filtration plus ozonation facility at a cost of \$101 million for a DBO approach versus \$171 million using the conventional Design-Build-Bid process. Wodraska notes, "while there is no one-size-fits-all for financing, certificates of participation (COP) offer another possible financial alternative to sustainable water infrastructure." COP is a pledge of future revenues to finance water infrastructure.

All of these projects demonstrate that there is no pat answer to the infrastructure funding gap. Bridging the gap will take not only creative financing options, but also innovative legislation and a shift in national political priorities. **H**

PBS&J PEOPLE NEWS



LIGHTS



Yasmin Moreno, PE





Christopher Campbell



Joe Adams has joined PBS&J as district director for PBS&J's Houston, Texas, office. He has 30 years of experience in the petroleum industry on both the domestic and international fronts. Adams is a member of the board of trustees for the Katy Independent School District, chairman of the board of directors for the Southern Federal Credit Union, and has a bachelor's degree from Texas

PBS&J's construction management division has added Christopher Campbell, PE, as a senior group manager. He has more than 22 years of experience with transportation and utility construction projects ranging from wastewater systems to tollway projects. Campbell holds a bachelor's degree from New Mexico State University (Las Cruces) and is a registered professional engineer in Texas. He's based in Dallas, Texas.

A&M University.

Kim Keefer, PE, has rejoined PBS&J as group manager of the Bartow, Florida, water division. She has 23 years of experience serving public sector clients in the areas of water, wastewater, and stormwater management. Keefer has a bachelor's degree in engineering from the University of Central Florida and is a registered professional engineer in Florida and Ohio.

PBS&J's architecture practice has added Bill Lenyk, AIA, NCARB, as a vice president and principal technical professional. He will lead the company's federal and private sector architecture practice in the mid-Atlantic states. Lenyk, who is located in PBS&J's Alexandria, Virginia, office, is a registered architect in Virginia, Maryland, New York, and the District of Columbia.

In Orlando, Florida, Yasmin Moreno, **PE**, has joined PBS&J as a senior project engineer in PBS&J's aviation program. She has more than 12 years of experience as a transportation/ aviation engineer and is a registered professional engineer in the state of Georgia. Moreno has bachelor's and master's degrees in civil engineering from Georgia Tech.

Senior group manager Jeff Sickles, **PE, CFM**, has been elected as Region VIII Director for the Association of State Floodplain Managers. As regional director, he will represent the interests of Region VIII membership to the ASFPM board of directors and executive staff. Sickles is based in PBS&J's Denver, Colorado, office.

PBS&J welcomes Celia Szelwach who joins The PBSJ Corporation as ethics and compliance manager. With 17 years of managerial and staff experience in organizational development, change management, leadership development and coaching, she will focus on training, education, and communications relating to ethics and compliance. Szelwach graduated from the U.S. Military Academy at West Point and has an MBA in international trade.

PBS&J senior engineer Alex Yescas,

PE, has been selected to serve on the board of directors for the Floodplain Management Association as the southern director representing California, Hawaii, and Nevada. A nonprofit educational association, FMA encourages the protection and enhancement of natural floodplain values through the use of effective floodplain management strategies and engineering technologies. Yescas is based in San Diego, California.

CURRENT NEWS

Team Reselected for South Louisiana Water **Resources Program**

Nearly a year and a half after taking on the role of assisting the federal government in its efforts to reconstruct hurricane-protection infrastructure in the greater New Orleans area, the engineering firms Evans-Graves Engineers, PBS&J, and HDR have been reselected by the U.S. Army Corps of Engineers (USACE) to provide program and project management support for its South Louisiana Water Resources Program.

The three companies are working together as if they were a joint venture, with approximately 100 staff members from the three firms working within the USACE's participating organizations. Encompassing hurricane protection and ecosystem restoration, the program includes levees, floodwalls, floodgates, and pump stations, as well as coastal protection measures.

The work to be carried out by the USACE is currently budgeted at more than \$14.6 billion, most of which is scheduled to be complete by 2011. Executed through the Corps' New Orleans District, the contract provides support to multiple USACE organizations, including Task Force Hope, the Hurricane Protection Office (HPO), the Protection and Restoration Office (PRO), and the New Orleans District itself.

PBS&J Recognized for Diversity and Inclusion

The Greater Miami Society for Human Resources Management (GMSHRM) (Florida) has recognized PBS&J for the company's "Outstanding Contribution to **Diversity and Inclusion Practices in** the Workforce," as part of its 2007 Celebration of Diversity.

GMSHRM annually sponsors this event, which includes an awards program, as a means of recognizing businesses that promote an "inclusive work environment." Candidates were judged in a number of areas. including how their diversity programs add measurable value to their company, how they work to strengthen community relations, and how such programs improve the quality of life for their employees.

GMSHRM is a Miami-Dade County organization serving human resources professionals. Their programs cover every aspect of human resources management, including employment, benefits, affirmative action, and training.

Texas State Veterans Cemetery at Abilene Breaks Ground

for future monuments.

PBS&J designed and planned the 63-acre cemetery with the Texas Veterans Land Board as part of the Texas State Veterans Cemetery Program, an initiative to build seven veterans cemeteries across the state—with the goal of having one within a two-hour drive of nearly every Texas city. The first interments are expected to take place in spring

A groundbreaking ceremony recently took place for the Texas State Veterans Cemetery at Abilene. The cemetery, which is being built near Lake Fort Phantom Hill, has an ultimate capacity of over 20,000 burials. It will feature a covered, open-air structure for committal services, a visitor's center, a computer system for locating specific graves or interments, an assembly area for special occasions, and a memorial walkway

2009. The new cemetery will join state veterans cemeteries in Killeen and Mission that were also designed and planned by PBS&J.

Science Center Benefits from PBS&J Donation

In an effort to ignite interest among teenagers in science, PBS&J recently presented a \$5,000 check to The Contemporary Science Center (CSC) at an event held on the campus of Meredith College in Raleigh. The donation was presented to Pamela Blizzard, executive director of the CSC, by PBS&J vice president Gene Conti, Jr., Ph.D., PE.

Through the CSC program, participating students are challenged to become researchers and scientists for a day through field studies in the areas of physics, biology, chemistry, and statistics. The program gives them the opportunity to apply "cutting-edge science principles" to real-world problems that could be experienced in the workplace.

The CSC was opened in 2004 in the Research Triangle Park as a way to expand the high school science experience for teenagers across North Carolina. Nearly 700 students have benefited from the program to date.



Gene Conti, PBS&J vice president, presents a check to Pamela Blizzard, executive director of The Contemporary **Science Center.**



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