Highway Robbery II

The Many Problems With Outsourcing Design, Engineering, Inspection & Supervision of Federally-Funded Transportation Projects: Increased Costs, Reduced Quality & Safety, and Little Accountability to the Public

A REPORT BY THE
NATIONAL ASSOCIATION OF STATE HIGHWAY
AND TRANSPORTATION UNIONS (NASHTU)
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About NASHTU

The National Association of State Highway and Transportation Unions (NASHTU) is dedicated to ensuring that federal transportation dollars are spent on cost-effective, safe projects that serve the public interest. NASHTU is comprised of 37 unions and associations representing hundreds of thousands of state and locally employed transportation engineers, technical workers and related public servants from throughout the United States.

About the Author

David Kusnet is a visiting fellow at the Economic Policy Institute. His articles and reviews have appeared in The New York Times, Washington Post, Los Angeles Times, Baltimore Sun, Newsday, American Prospect, New Republic, Commonweal, New Leader, and other newspapers and magazines.

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TABLE OF CONTENTS

EXECUTIVE SUMMARY

Executive Summary

- The nation is making large-scale and long-overdue investments in highways, bridges, mass transit systems, and similar projects. The total investment will be $286 billion from 2005 through 2010, on top of an earlier commitment of $217 billion from 1998 through 2004.
- There must be real accountability for how this huge amount of federal money is spent by state departments of transportation. Unfortunately, the transportation appropriations bill for the 2006 fiscal year, which funds the recently renewed federal transportation program, actually restricts the states' efforts to hold consultants and contractors accountable for the cost and quality of their work.
- The outsourcing of engineering, design, inspection, supervision, and management of these projects is increasing exponentially – usually without competitive bidding, often with cost-plus contracts.
- That's in spite of the fact that 80% of comparative studies show that outsourcing engineering and similar functions costs more than doing the work in-house.
- Worse yet, there are growing numbers of overcharges, delays, and dangerous construction problems in projects where the engineering, design, inspection, supervision and management has been contracted out. For instance, the "Big Dig" project in Boston, took seven years longer and cost $12 billion more than original estimated. In the summer of 2006, a section of the ceiling on a tunnel collapsed, killing a woman, injuring her husband, and forcing part of the project to be closed for several weeks.
- Contracting out can be part of a budgetary shell-game: State transportation departments are freezing or cutting their engineering and technical staff, while contracting-out increasing amounts of work.
- State departments of transportation are losing experienced and dedicated professional staff and failing to recruit and retain a new generation of engineering and technical employees. If outsourcing continues to increase, states will lose their capacity not only to engineer and design transportation projects but also to oversee the consultants' work and protect the public's interest in safety, quality, and economy.
- That's why it is so important that Congress consider "accountability in contracting" provisions requiring state transportation departments to conduct cost-benefit studies before outsourcing engineering and similar services on federally funded projects. States should also take steps to hold private consultants and contractors accountable for the cost and quality of their work. The nation needs to make sure that the taxpayers get their money's worth for the essential investments Americans are making in transportation.

State and local governments are making large-scale and long-overdue efforts to build and repair highways, bridges, mass transit systems, and similar projects. These important investments are being encouraged and assisted by a major federal program -- the Transportation Equity Act for the Twenty-First Century (TEA-21), for which $217 billion was provided in 1998 and an additional $286 billion was approved in 2005 for the next five years[1] under the Safe, Accountable, Flexible, Efficient Transportation Equity Act (SAFETEA-LU).

These investments are essential for America's future. An expanding population, a growing economy, and a deteriorating infrastructure, all require that the nation build new means of transportation and repair old ones in order to keep our people, our products, and our prosperity on the move. The costs of inaction would be considerable: Traffic congestion costs American drivers 3.6 billion hours of delay and 5.7 billion gallons of wasted fuel every year at a time when gasoline prices are soaring. Moreover, poorly maintained roads and highways are among the causes of an estimated one-third of the 42,000 traffic fatalities that take place every year.

Indispensable as these investments are, they must be made wisely. There must be real accountability for how this huge amount of federal funding is spent. Unfortunately, the bill that provided the first year of appropriations for the recently renewed federal transportation program makes it more difficult for state departments of transportation to hold their consultants and contractors accountable for the cost and quality of their work by conducting audits of these outside firms and their work on their projects.

Highway Robbery II

Consultant Costs Skyrocketing

Using this large and growing pool of federal funds, state transportation departments are dramatically increasing the amount of engineering and design work that they outsource to private consultants, rather than relying on state engineering and technical employees. From 1998 to 1999, the first years of the TEA program, contracting –out increased from 35% to 42% of state preliminary engineering expenditures[2]. In several major states, the use of consultant engineers have increased exponentially, growing by 2,650% in New Jersey over ten years[3] and by 720% in Texas from 1994 through 1999[4].

More recently, the states have continued to increase their outsourcing of engineering and design work. In a report released in 2006 and covering the years 2000 through 2003, the audits division of the Oregon Secretary of State's office surveyed 16 state transportation departments and found that 12 had increased their use of consultants over the last five years.[5]

Meanwhile, many of the projects whose engineering and design work was outsourced are costing more than was originally anticipated and are developing serious problems with quality and safety. For instance, the Central Artery Tunnel project in Boston – more commonly called "Big Dig" – had $1.4 billion in cost over-runs in 1999 alone[6], and its cost increased from the original estimate of $2.6 billion to a total of $14.635 billion by 2005. And Los Angeles' Red Line subway was plagued by problems including sinkholes in the streets, fraudulent inspections, and 60% more injuries among its construction workers than the national average for such projects[7].

Problems with Safety and Quality

Frequently, there are dangerous construction problems in projects where the engineering, design, inspection, supervision and management have all been outsourced. For instance, in Massachusetts' "Big Dig" – an eight-lane underground highway through the middle of downtown Boston – a section of the ceiling collapsed on July 10, 2006, landing on a car, killing Milena Del Valle and injuring her husband Angel.[8] As the National Transportation Safety Board later reported, the Big Dig tunnels were designed with a smaller margin of safety than similar tunnels elsewhere in the United States. Among other problems, the ceiling was built with only half as many bolts as the original design would have provided, and there were no beams attaching the ceiling to the walls to prevent the roof from collapsing if the bolts fell out, as eventually happened.[9] Two years earlier, a gap opened in the tunnel's wall, spilling 300 gallons of water a minute onto the roadway. Remarkably, no one was killed or injured. The Massachusetts Turnpike Authority later determined that there were more than 100 defective or leaking wall panels.

Huge projects aren't the only ones with serious safety problems. On May 15, 2004, near Denver, Colorado, a 200-foot-long steel girder, which was temporarily braced and was supporting an overpass that was being widened, rotated and collapsed onto the I-70 highway underneath it. As the girder fell, it hit a sport utility vehicle driving under the overpass and killed the driver, William J. Post, his wife, Anita, and their two-year-old daughter, Koby Anne.

After investigating the collapse, the National Transportation Safety Board (NTSB) concluded that poor construction and planning and inadequate state oversight were all at fault. In order to avert future disasters, the board voted unanimously to recommend stronger supervision of contractors by state highway departments, as well as consistent federal and state guidelines for designing and certifying bridges and highways.[10]

Budgetary Shell-Game

Outsourcing is attractive to many state transportation departments because it can be part of a budgetary shell-game. As their budgets tighten, state officials are under pressure to freeze or even cut their engineering and technical staff. By contracting-out engineering and design, state transportation departments can claim to be reducing their numbers of full-time employees, even while their consultant costs are skyrocketing.

For instance, in the New York State Department of Transportation, the total number of engineering positions declined by 10% from 1995 through 1998[11]. Meanwhile, the department uses consulting firms for 20% of its projects that amount to 50% of its total construction budget, even though a study by the accounting firm KPMG reported that consultants were more expensive than state engineers in 85% of the projects that were examined.[12]

Why Consultants Cost More - No Competitive Bidding, Cost-Plus Contracts

Unlike many other government contracts, almost all contracts for consultants to do design, engineering, inspection and project management are awarded without competitive

bidding. In addition, many of these agreements with consultants are "cost-plus contracts" – contracts that commit state and local governments to pay for any and all costs that the contractors incur.

Higher salaries than in state government, profit margins of up to 15%[13], the lack of competitive bidding, cost-plus provisions, and additional costs connected with supervising outside consultants -- all explain why more than 80% of comparative studies have found that contracting-out engineering, design, and inspection costs more than performing these functions in-house.[14]

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Brain Drains from State Transportation Departments

Moreover, the growing outsourcing of engineering, design, and inspection is curtailing the capacity of state and local governments to do this work themselves. As private consulting companies perform an ever-larger share of engineering and design work – particularly the most interesting assignments – career professionals have less reason to continue working for state and local governments and more incentives to go to work for private firms themselves. Many major companies are stepping-up their efforts to recruit career professionals from states and cities, offering them higher salaries than they could ever earn from government work, so that they can help obtain new contracts from their former colleagues.

Thus, outsourcing feeds upon itself – at the expense of the public that pays the bills. Claiming that public agencies don't have the staff to do the jobs, state and local governments contract-out the engineering and design. As private firms snag more and more contracts, career employees leave state and local departments of transportation to go where the action, the money, and the prestige are. In this way, contracting-out generates even more contracting-out, and the case for hiring outside consultants becomes a self-fulfilling prophecy.

The Loss of Accountability

As they fail to replace the professional staff that they lose, state and local transportation departments are losing the capacity to supervise and inspect major projects, as well as engineer and design them. This calls into question whether transportation departments can hold consultants accountable for the cost, quality, and timely completion of their work – a problem that is being exacerbated now that consulting firms are taking on new roles. Increasingly, private companies are being hired to inspect, supervise, and even manage entire projects, as well as doing the design and engineering work. When the same team of consultants who design a project also manage and inspect it, it becomes difficult for the public officials who commissioned it to hold the consultants responsible for doing their jobs on time, on budget, and in keeping with the requirements of safety and amenity.

When private companies design, engineer, inspect, and manage entire projects, state transportation departments that have cut back their professional staffs can't hold consultants accountable for the cost, quality, and safety of their work.

One Remedy: Accountability in Contracting

These problems explain why proposals are being offered to hold state departments of transportation and the engineering and design firms that they hire with federal funds more accountable to the taxpayers whom they serve. Unfortunately, Congress has not acted on a proposal that would require state governments to conduct cost-benefit studies before using federal highway funds for contracts to private consultants for design, engineering, and similar services, such as survey work and materials testing and inspections. In fact, in an action that moves federal policy in the wrong direction, the bill that provided the first year of appropriations for the recently renewed federal transportation program makes it more difficult for state departments of transportation to hold their consultants and contractors accountable for the cost and quality of their work by conducting audits of these outside firms and their work on their projects. Fortunately, however, several state legislatures have begun to take action.

Highway Robbery II

Accountability-in-contracting proposals would not eliminate the outsourcing of engineering and design work when it is the most efficient way to design and engineer transportation projects. They would require that the use of private consultants be justified in terms of the cost, efficiency, and the comparative capacities of private firms and public agencies to do the job in the best, the fastest, and the least expensive way possible.

Encouraging and Informing a National Discussion

With tens of billions of federal dollars funding transportation projects and state agencies deciding whether to farm out the design and engineering work or do it themselves, the nation's leaders need to debate and decide the policies that will make sure that the taxpayers get the most for their money. This report seeks to encourage and inform this much-needed national discussion.

This report explores:

1. The increasing size and scope of the outsourcing of design, engineering, and related work on federally funded transportation projects;

2. The growing body of research suggesting that outsourcing design and engineering is inherently more costly than doing it in-house;

3. The ways in which the excessive reliance on private consultants depletes the professional staffs of state and local departments of transportation;

4. The issues of accountability that arise when state transportation departments lack the staff to supervise the consultants' work, and private consultants increasingly conduct inspection and management, as well as design and engineering;

5. The problems that arose when design and engineering, and often management and inspection as well, were contracted-out in major projects in Massachusetts and California.

6. And a proposal that has been presented in Congress to require state departments of transportation to justify their use of private consultants to do design and engineering work on federally funded projects, as well as similar initiatives in the states and other positive proposals to promote accountability.

This study was commissioned by the National Association of State Highway and Transportation Unions (NASHTU), a coalition of 37 unions and associations representing hundreds of thousands of transportation engineers and technical employees in state and local governments throughout the nation. Originally released in 2002, this report was updated in 2007, and, unfortunately, the problems that it explores have only been exacerbated over the past four years. While this report draws upon these employees' experiences, it relies more heavily upon studies commissioned by state transportation departments throughout the nation, investigations conducted by federal and state officials, and investigative reports and news stories in newspapers and magazines, including trade journals for engineering, design, and construction contractors.

We are sharing our findings with policymakers, journalists, and concerned citizens in the hope of encouraging debate and informing decision-making about how to obtain the maximum value from Americans' investments in federally funded transportation projects. These investments are urgently needed and so are mechanisms to make sure that the taxpayers get their money's worth.

I. Getting Contracts "While the Federal Money Is Hot"

- ***The federal government is providing at least $57 billion-a-year for urgently needed state transportation projects and related programs. The taxpayers need to make sure they're getting the most for their money – much of which goes to engineering and design.***

- ***State governments are outsourcing more and more engineering and design. In one recent year, throughout the country, outsourcing increased from 35% to 42% of total state spending on preliminary engineering work on transportation projects. In New Jersey, outsourcing skyrocketed by 2,650% in 10 years!***

- ***Outsourcing can be a fiscal shell game. State transportation departments can brag that they've cut or frozen their own engineering and technical staff, while they hush-up the increased costs of consultant contracts.***

- ***That's why so many state transportation departments keep contracting-out engineering. As scholars from Rutgers University concluded, "The New Jersey Department of Transportation has been outsourcing work when the available empirical evidence suggests that outsourcing costs more."***

- ***Construction industry giants like Bechtel and Parsons Brinckerhoff are lobbying for engineering, design, inspection, and supervision contracts for transportation projects. One trade journal advises private companies to get moving "while the federal money is hot."***

From constructing canals and railroads in the Nineteenth Century to building the interstate highway system in the Twentieth Century, ambitious transportation projects have helped to build our country and bring it closer together.

Now, as the Twenty-First Century begins, the nation is engaged in a program of building, repairing, and maintaining its transportation infrastructure as ambitious as these earlier efforts. The Transportation Equity Act for the Twenty-First Century (TEA-21) and its successor, the Safe, Accountable, Flexible, Efficient Transportation Equity Act (SAFETEA-LU) are the largest federal public works programs in the nation's history.[15]

Authorizing $217 billion in federal funds through Fiscal Year 2003, the TEA-21 program pays for as much as 90% of the cost for state governments to build or repair surface transportation projects of all kinds. TEA-21's funding – which exceeded $57 billion a year – represents an increase of more than 60% over the resources provided by its predecessor program, the Intermodal Surface Transportation Efficiency Act (ISTEA).[16] In 2005, Congress approved an additional $286 billion for the next five years[17] under the Safe, Accountable, Flexible, Efficient Transportation Equity Act (SAFETEA-LU).

Encouraged and assisted first by TEA-21 and now SAFETEA-LU, state departments of transportation have initiated or expanded projects to build, complete, repair or maintain roads, highways, bridges, mass transit systems, and similar facilities. These projects are helping the nation meet the needs resulting from an increasing population, an expanding economy, and a deteriorating infrastructure.

Dramatic Increases in Outsourcing

In order to design and engineer these projects – and, often, to manage, supervise, and inspect the work as well – state departments of transportation have made extensive and expensive use of private consulting firms. During TEA's first year alone, the share of state preliminary engineering expenditures that went to private firms increased from 35% in 1998 to 42% in 1999.[18]

In state after state, outsourcing has become a centerpiece strategy for what the American Association of State Highway and Transportation Officials (AASHTO) described, in the title of a major report, as "The Changing State DOT (Department of Transportation)."

Highway Robbery II

For instance, in New Jersey, the outsourcing of engineering and design work for transportation projects has increased exponentially over the past ten years. In 1993, the state Department of Transportation awarded six new contracts, with a total cost of $3.9 million. But, in fiscal year 2002, the department awarded 31 new contracts, with a total cost of $105.4 million – an increase of 2,650% in only ten years.[19]

The outsourcing of engineering and design work has increased almost as dramatically in Texas. From 1994 through 1999, the state's contracts to private firms for "preliminary engineering" skyrocketed from $15 million to $123 million – a jump of 720%.[20] Remarkably, in response to lobbying by private firms, the Texas Legislature passed a law in 1997 requiring that at least 35% of all the department of transportation's engineering work must be contracted-out to consultants.[21]

In Texas, where the State Legislature actually mandated that the transportation department outsource at least 35% of its engineering work, contracting-out increased by 720% from 1994 through 1999.

Meanwhile, in Florida, according to the state department of transportation's response to a survey in 2001, consultants perform 76% of the total design work.[22] As the department explained in response to questions from the National Cooperative Highway Research Program: "This includes project development and environmental studies, all aspects of design and post-design services such as shop drawing review."[23] At headquarters, the department noted: "Consultants are used to accomplish approximately 40% of planning performed in the central office, which is responsible for policy and statewide programs."[24] Moving outside the central office, the department continued: "Consultants are used to accomplish over 60% -- in some areas, as high as 75% -- of planning performed in the districts, which are responsible for all of the Department's regional, metropolitan, and local planning responsibilities."[25]

Outpacing even Texas, Florida, and New Jersey are five states that outsource virtually all of their preliminary engineering work: Illinois, Indiana, Iowa, Louisiana, and Rhode Island.[26] Indiana has virtually privatized the entire function, outsourcing 99.8% of its preliminary design work.[27]

While state, federal, and local transportation projects have long been built almost entirely by private contractors, the growing reliance on private engineering and design firms is a new development. Historically, state and local departments of transportation have maintained their own staffs of career engineering and technical employees. Although some state and local transportation departments have contended that the new wave of projects stretches their existing professional workforces beyond their limits, the growing use of outside consultants reflects a conscious decision to rely on private companies rather than expand their own capacity.

Budgetary Slight-of-Hand

That is largely because outsourcing can be a form of fiscal sleight-of-hand. At a time when state budgets are getting tighter, transportation departments can freeze or even cut their own engineering and technical staff and rely on consultants to perform a growing share of the work, especially when federal funds allow for large new projects to be commissioned. This pleases state legislators and other influential audiences who look more closely at the numbers of full-time employees and regular payroll costs than at the costs of outsourcing.

Two studies of the outsourcing of design and engineering work on transportation projects support this explanation of why outsourcing is so convenient. As scholars from the Eagleton Institute of Politics at Rutgers University concluded in their report, ***An Evaluation of Contracting-Out Activities in the New Jersey Department of Transportation***:

The contracting-out shell game: State transportation departments cut or freeze state engineering and technical employees. Then they hire many more consultant engineers – at higher costs.

"The New Jersey Department of Transportation has been contracting-out work when the available empirical evidence suggests that contracting-out costs more. The explanation may be that contracting-out is more a result of trends in the department's funding sources and restrictions placed on the management of the department than actual cost savings."[28]

In a similar analysis, a study prepared for the National Cooperative Research Program observes that two of "the key drivers influencing DOT's demand for outsourcing" are:

- "Reduction in workforce in departments of transportation and/or loss of in-house specialty capabilities"; and
- "[State] Legislators like outsourcing."[29]

One other important reason why "[State] Legislators like outsourcing" is that they and other public officials are besieged by major engineering, design, and construction management firms that are aggressively lobbying for government contracts. These companies include industry giants such as the Bechtel Corp. of San Francisco and Parsons Brinckerhoff of New York City, both of which are major contributors to political candidates for federal, state, and local offices throughout the country.[30]

"Pay to Play": Private Companies Pursue Consultant Contracts

With the passage of TEA-21 and the flow of federal funds to state departments of transportation, private companies stepped up their efforts to obtain lucrative contracts to design, engineer, inspect, and even manage new projects. As one trade journal advised its readers, it was time to "Get the project started while the federal money is hot."[31]

Throughout the nation, there are numerous examples of politically connected companies receiving state contracts, often after donating large sums of money to the political campaigns of the same public officials who approved those agreements. Here is a (partial) dishonor roll of states where "pay to play" is a watchword for receiving lucrative transportation contracts:

New Jersey: The New Jersey Department of Transportation paid $136,000 to a private company to do work that regular employees could have completed for $10,000. The engineering firm Edwards and Kelsey was paid that sum to convert the signs and measurements to the metric system on 90 road design maps used by department engineers. State employees involved in drafting told the department they could have done the work themselves for under $10,000. The company had donated a total of $112,000 to the state's Republican and Democratic parties from 1990 through 1995.[32] "Pay to play" has been a way of life in New Jersey; consulting engineering firms that do business with the state Department of Transportation contributed $8.5 million to state and county political committees and to candidates from both major parties from 1999 through the middle of 2003.[33]

Wisconsin: In a similar incident, reported in 2004, the Wisconsin State Department of Transportation paid a company nearly $80-an-hour to maintain an inventory of road signs after eliminating the job of a state employee who did the same work for an hourly wage of $11.38. The private firm, HNTB, received a $164,692 contract, on which it expected to make a $13,103 profit, to keep track of the signs on state roads after the company's executives made more than $140,000 in campaign contributions to politicians from both parties, including the former Republican Governor, Tommy Thompson, and the current Democratic Governor, Jim Doyle. Confronted with the fact that the private firm was much more expensive than the state employee had been, Governor Doyle's spokesman, Dan Leistikow, admitted to the Associated Press: "The cost of the contract does not appear to be a very good deal for the state."[34]

The appearance of pay-to-play continued during 2005, when Deputy Transportation Secretary Ruben Anthony, Jr., invited dozens of consulting firms, including HNTB, to a fundraiser for Governor Doyle's re-election campaign. Doyle attended the fundraiser, along with State Transportation Secretary Frank Busalacchi and representatives of several consulting companies, including HNTB, CH2M Hill Inc., and Ayers Associates. While Department of Transportation officials claimed that Anthony played no part in selecting consultants, the ***Milwaukee Journal-Sentinel*** found a state document suggesting that he did have the last word on deciding which firms got more than $100 million in consulting contracts awarded annually by the state Transportation Department.[35]

Less than a year earlier, the Transportation Department demoted its top attorney, Jim Thiel, after he released a report that found that it is less expensive to have design work done by state engineers rather than outside consultants. Thiel had emailed a copy of the report to the ***Milwaukee Journal-Sentinel*** shortly after noon on Friday, December 10. At 8:00 in the morning on the following Monday, he was notified that he had been reassigned to a position with fewer responsibilities.[36]

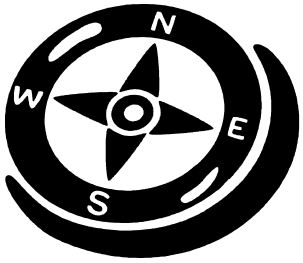
Ohio: In Ohio, 20 firms received almost 60% of the money spent on engineering and design contracts from the state Department of Transportation from 2000 through 2005. During the same period, these companies contributed more than $700,000 to political candidates from both major parties, the

Highway Robbery II

state Republican and Democratic parties, and political action committees, according to an investigation by the ***Toledo Blade.*** In addition, twelve of these companies contributed another $336,000 to the Republican Governors Association, whose chief fundraiser at one time was Brian Hicks, who served as chief of staff for Governor Bob Taft. Looking to the 2006 gubernatorial election, these firms had already contributed $134,000 to a Democratic contender, Columbus Mayor Mike Coleman, and $110,000 and $96,000, respectively, to two Republican contenders, Attorney General Jim Petro and Auditor Betty Montgomery.[37]

Indiana: In Indiana, the state Department of Transportation simply selects which engineering firms will design its projects, without even asking these companies to bid on the work. In an investigation of abuses in this system, WISH-TV in Indianapolis found that ten engineering firms out of 82 got more than half of the $155 million in consulting contracts that the state Transportation Department had awarded from 1992 through 2004. Of the department's top 20 engineering and construction contractors, WISH-TV found that they had made a total of almost $750,000 in campaign contributors to former Governor Joe Kernan, a Democrat, and current Governor Mitch Daniels, a Republican. Directly and indirectly, they also donated some $35,000 to state legislators on the roads committees.[38]

Connecticut: In Connecticut, the consulting firm that receives the most contracts for engineering and design has been Close, Jensen and Miller, P.C. The firm increased the value of its consulting work with the state Department of Transportation from $2.8 million on November 1, 1999, to $10.175 million on November 1, 2003, largely through expanding the scope and increasing the cost of its contracts with the agency. The firm's owner, John H. Miller, contributed some $40,000 to Republican candidates for state and federal offices during the 1998 and 2002 elections.[39]



As the cost-comparison studies that are discussed in the next section of this report reveal, the story of the map-changers in New Jersey and similar abuses in other states are all too typical of outsourcing.

II. Why Consultants Consistently Cost More than Regular Employees

- ***More than 80% of cost comparison studies have found that it costs more to have consultant engineers do the design work on state transportation projects than to use career public employees. While some studies show the costs are about the same, no studies contend that state engineers cost more.***
- ***That's because salaries are higher at private firms, private firms make profits of from 10% to 15%, and state transportation departments still need to spend time and money selecting and supervising the consultants.***
- ***Another important reason why consultants are so costly: Most of their contracts are awarded without competitive bidding!***
- ***On top of that, many engineering firms' contracts are cost-plus – so the taxpayers have to pick up the tab for all the costs that they claim!***

Private engineering consultants cost more than their public sector counterparts.

That is the clear conclusion of decades of studies by state agencies, academic researchers, and the news media. In fact, it goes back to the days of Moses – the legendary Robert Moses, who spearheaded such projects as the Triborough Bridge in New York City during the 1930's. At that time, a study presented at a City Council hearing showed that, when civil service employees designed major public works, engineering amounted to 3.2% of the projects' total costs, but when private consultants did the design work, their costs amounted to 6-7.5% of the total.[40]

More recently, of at least 17 studies performed during the past two decades comparing the costs of conducting pre-construction engineering design by in-house staff or private consultants, more than 80% of these reports have found that regular public employees are less expensive than private contractors, with the difference in costs ranging from 30% to 100%.[41] Of the remaining studies, all but one found no significant difference in costs – there is no body of research claiming to find that private contractors are less expensive than regular employees.

The reasons why consultants are more expensive include:

- **No Competitive Bidding**: Most state departments of transportation award contracts for engineering, design, and related professional services without competitive bidding. In theory, the determination is made on the basis of factors such as the consultants' experience. The absence of cost comparisons during the selection process removes one potential way of controlling costs once the work is underway.
- **Cost-plus Contracts**: In addition, many consultant contracts are "cost-plus," providing that the engineering firms will be reimbursed for all the expenses that they claim. This lends itself to abuse and overcharges, just as "cost-plus" contracts did in defense spending in the decades past.
- **Higher Salaries**: Most studies have found that private firms pay higher salaries than state departments for comparable positions. Thus, the California Legislative Analyst found that, in 1994, engineers at the state department of transportation cost $75,000 per person per year, compared to $124,000 for their counterparts at consulting firms.[42] By 2004, the gap had grown to $105,000 for state engineers and $178,000 for consultant engineers.[43] Similarly, in 1998, the New York State Comptroller found that engineers at private contractors can be as much as $20,000 or more a year more costly than state engineers.[44]
- **Profit and Overhead**: In Texas, the ***Houston Chronicle*** reported that private engineering firms earn profits of from 10-15% on their contracts with the state department of transportation.[45] In a similar finding, the California Legislative Analyst found that overhead amounts to 203% of consultants' total salaries.[46]

- **Consultant Management**: Specifications must be set for the work that is to be contracted-out. Proposals must be solicited, compared, evaluated, and decided upon. Consultants must also be selected, contracts must be prepared, and the project must still be supervised. All this work is involved in outsourcing projects – and it consumes regular employees' time and the taxpayers' money.

A study by researchers at the Eagleton Institute of Politics at Rutgers University, explained why excessive costs result from the procedures under which engineering work is outsourced in New Jersey and many other states. Because so many contracts are awarded without competitive bids, the study observes: "The procurement process … cannot identify the lowest, responsible bidder."[47] This inherent lack of cost controls refutes the leading argument for contracting-out:

"The appeal of privatization is rooted in the promise of cost savings. Those cost savings can be realized only if the procurement process that the public sector uses identifies the lowest cost contractor who can satisfactorily or responsibly perform this work. To the extent that the procurement practice fails to accomplish this end, the cost advantage that privatization promises is exaggerated."[48]

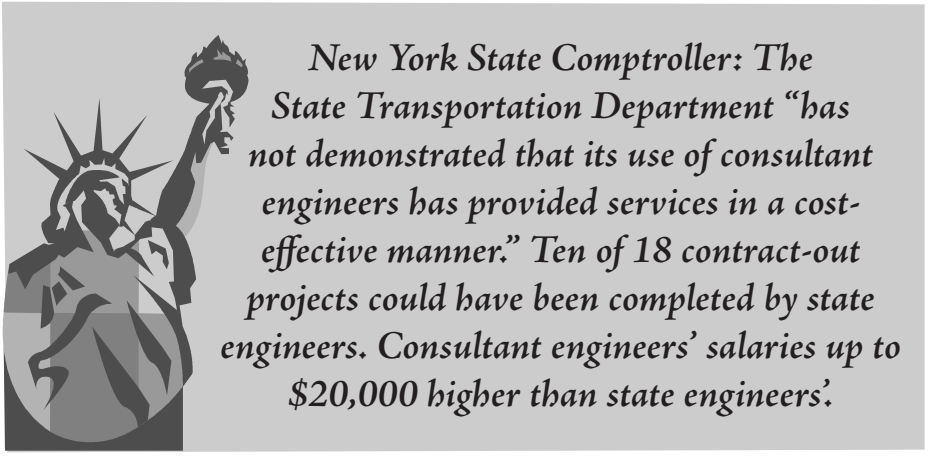
Major statewide studies and journalistic investigations offer extensive evidence that private consultants are more expensive than regular employees and are being used excessively and often unnecessarily by state departments of transportation:

New York State

In spite of several reports that found that using state engineers is less expensive, New York State's department of transportation continued to use consulting firms for 20% of its projects amounting to 50% of its total construction budget.

For instance, a study of the department by the accounting firm KPMG reported that consultants were more expensive than state engineers in 85% of the projects that were examined. This study further concluded that, if the department had cut its use of consultants in half between 1991 and 1999, it could have saved $274 million.[49] That money could have been used to build, maintain, and repair highways and bridges.

In response to such studies, the department agreed to hire more staff rather than rely more heavily on consultants. But further investigations found that the department had continued to contract-out increasing amounts of work.



In response to this situation, in 1998, the State Comptroller's Office released a report with these conclusions:

- "We found that the Department has not justified its decision to contract-out more of its capital projects to consultant engineers, rather than hire additional Department staff, as it had agreed to do in 1990."

- "Further, the Department has not demonstrated that its use of consultant engineers has provided services in a cost-effective manner."[50]

Far from requiring specialized experience and expertise that could only be obtained from outside sources, the Comptroller's Report found: "The Department is using consultants to carry out many projects which Department officials acknowledge are routine in nature." For instance, in Fiscal Year 1995-96, of 55 contracts totaling $54.2 million awarded to consultants for construction inspection projects, only one was awarded "because of the need for special expertise." [51]

Similarly, during the same period, the department's consultant management bureau awarded 18 design contracts, totaling $30.3 million. But the Comptroller's report found that department officials themselves acknowledged that 10 of the 18 projects were routine in nature and could have been completed by state engineers. Of the remaining eight projects, only certain aspects of these jobs required specialized skills.

Turning to the issue of comparative costs, the Comptroller's report noted that, in its own 1993-94 budget request, the department "indicated that it is more costly to have designs done by consultants" and expressed the long-range goal of doing more jobs in-house.[52]

Higher salaries for consultant engineers were one reason why outsourcing was more expensive. While entry-level salaries were about the same, the top of the salary structure was much higher in private companies than in state departments. Thus, consultant engineer salaries were from $1,500 to $20,000 higher than salaries for state engineers.[53]

Profits – or "fixed fees" – for consultant contracts also pushed their costs up, the Comptroller found. The study found these ranging from 8.4% to 15% of the total costs.

In yet another indication that private consultants are more expensive, the Comptroller noted that the department had conducted its own comparison of inspection costs in two regions, Syracuse and Watertown. Having found that state employees were less expensive, these two regions are now using in-house employees to inspect all local bridges.

Texas

In Texas, a study by Price Waterhouse Coopers examined almost 6,000 design jobs conducted by state engineers or private consultants. This study made allowances for the size and complexity of the jobs, whether they were urban or rural, and other factors that might affect the comparison of costs.

All in all, the study found that outsourcing was 62% more expensive for 8 of 13 different kinds of design work for the department of transportation. In the remaining five categories, cost differences could not be determined. And the study found no difference in quality between designs produced by consultants and state employees.[54]

California

In 2001, the California Legislative Analysts Office reported: "By Caltrans' [California Department of Transportation] own description, it would cost the department $2,119,000 to use staff to do bridge scour evaluation," compared to the $4.3 million necessary "for local agencies to contract-out the work directly."[55]

Among the factors contributing to the difference in costs between the public and private sectors were:

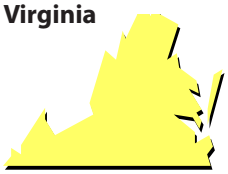
- In 2004, the Department of Finance testified at budget hearings that a consultant engineer costs the state (including salary, benefits and overhead) on average $178,000 a year while a state engineer costs $105,000 a year.
- The additional administrative overhead and oversight that consultants require would contribute to outsourcing being twice as expensive as having state employees do the work. [43]

Louisiana

Echoing the finds of similar studies in other states, a report by the Louisiana Department of Transportation found that the average cost of in-house design was 77% of what consultants charge.

While determining that consultants are considerably more costly, it found no significant difference in the skills of in-house and outside engineers and the quality of the work they did. It also highlighted the costs incurred by the state in preparing and overseeing the consultants' contracts. [56]

Virginia



Despite a study that found that consultants are more expensive, Virginia has continued to outsource the design and inspection of state highways and bridges.

In a 51-page report completed in 1999, the Virginia

Highway Robbery II

Department of Transportation (VDOT), found that consultants were charging 45% more than it would have cost state employees to complete 50 of the 450 projects where design and related services were being contracted-out.

In a similar study in 1998, VDOT found that it was spending eight times as much on consultants that year as in 1987. This study also recommended that VDOT look into the issue more and report back to the Legislature.

In spite of this recommendation, and partly because of a turnover in state highway commissioners, VDOT did not release the 1999 report until April, 2002, just three months after a new governor, Mark Warner, had taken office.

Under Warner's predecessors, Governors George Allen and Jim Gilmore, the outsourcing of design and inspection increased substantially. Meanwhile, more than 1,200 employees left VDOT during Allen's term alone, and the department's staff is now approximately as large as it was in 1980.[57]

Connecticut

In a 1994 study, the Connecticut Department of Transportation found that it is less expensive to use in-house staff to do design work and inspection for projects under $5 million. The report recommended that projects under $5 million be designed and inspected by in-house engineering staff.

Using five different accounting methods, the study analyzed the design costs on 653 projects and the inspection costs on 396 projects, all of which were under $5 million. It documented savings of 29% for using in-house engineering staff and 18% for using in-house inspectors.[58]

In a follow-up to the study, the Connecticut State Employees Association analyzed all active consulting engineering contracts for the period October 1, 2002, through June 30, 2004. This found that the total cost of hiring a consulting engineer was on average $17,900 more expensive than hiring a comparably skilled state engineer. This differential is largely explained by the fact that private-sector salaries are considerably higher than those in state government: Consulting engineers earned an average of $71.26 an hour during 2001-2004, compared to $34.39 for state engineers; consulting senior engineers earned $98.98, compared to $39.19 for their counterparts in state government; and consulting project managers earned $116.63, compared to $46.28 for their counterparts in state government. In addition, benefits, fringes and overhead for consulting engineers far exceed the figures for state engineers.[59]

Wisconsin

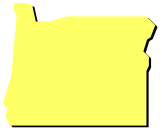
In one more evaluation of the costs of outsourcing, the administrator of Wisconsin's Division of Transportation Districts, Lynn R. Judd, provided a comparison of engineering costs per mile for consultants and in-house staff. In a memo to State Senator Joanne B. Huelsman, she reported that state employees' design costs amounted to 14.1% of total project costs, compared to 16.4% for consultants.[60]

In 2006, the State Engineering Association Compensation Committee compared the salaries of engineers in state government with the salaries paid to engineers employed by the Milwaukee Transportation Partners, a joint venture of several consulting firms that has received a contract from the state for the preliminary design of a freeway project in southeast Wisconsin. As with many agreements with engineering and design firms throughout the nation, this is a cost-plus contract, where the state pays Milwaukee Transportation Partners the costs of its employees' salaries, benefits and time off, as well as a guaranteed profit of 9% over the cost of direct expenses.

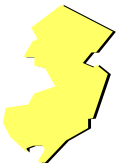
The study found that the salary for the average non-management, non-supervisory engineer at Milwaukee Transportation Partners is 27.2% higher than the salary for the average non-management, non-supervisory engineer in state government. Moreover, when the state substitutes an engineer from Milwaukee Transportation Partners for a state engineer, the state government also pays an additional 9% profit to Milwaukee Transportation Partners. Therefore, the cost for the engineer at the partnership of private firms is more than 38% higher than the cost for the state engineer. [61]

Oregon

In Oregon, the Audits Division of the Secretary of State's office examined a sampling of the state Department of Transportation's consulting contracts for engineering and design from 2000 through 2003, comparing the outside firm's paid invoices with the estimated costs of doing the work in-house. The study found that the consultant costs were approximately 20 percent higher. Forty-three percent of the difference in costs resulted from consultants' profits; 34% was attributed to the cost of monitoring the contracts; and 23% was caused by the difference between salaries and benefits at the consulting firms and the lower levels of employee compensation in state government.[62]



New Jersey



In New Jersey, in 2003, the state Department of Transportation completed three consecutive studies comparing in-house costs with consultant costs for design projects, construction inspections, and bridge inspections. Using a methodology developed by the libertarian Reason Foundation, which would have been expected to favor privatization, the state Department of Transportation examined 25 separate projects. The department's findings reveal that performing bridge inspections in-house would result in average savings of 52%, performing construction inspections in-house would reduce costs by 33%, and performing design projects in-house would save 30%. All in all, doing the work in all three areas in-house, instead of contracting it out, would save New Jersey $26 million annually. [63]

Why are the consultants more expensive? The consulting firms pay higher salaries for their engineers, and especially for their managers, than the state government pays its own engineers and managers. In addition, the overhead rates for the engineering and design consultants amount to 145% of the cost of salaries and benefits for the consulting firms' employees, and the consulting firms' profit margins average 24% of their wages.[64]

New Mexico

In New Mexico, the state performance review conducted for Governor Bill Richardson recommended a reversal of the trend towards contracting-out design work on state transportation projects. As of 2003, when the report was released, about half the state Department of Transportation's design work was contracted out to outside firms under design contracts costing $10 million a year. [65] The report noted that, throughout the nation, 14 of 17 independent studies of the costs of designing transportation projects found that consultants are more expensive than state employees. Therefore, the report concluded: "the Department of Transportation's internal design staff should evaluate all routine projects to determine whether taxpayer savings can be gained through in-house design. Whenever possible, in-house personnel should be used.[66]

South Carolina

In a study of the state Department of Transportation, the Legislative Audit Council found that outsourcing the engineering and management of construction projects contributed to $50 million in wasted spending. Released on November 14, 2006, the report found that the department's history with one engineering firm "raised questions of favoritism and ineffective management of resources." Meanwhile, contracts to outsource the management of transportation projects resulted in needlessly higher costs, including an unnecessarily high management fee of $32 million for one contractor and $8.7 million for projects that were not completed. [67]

Colorado

In May 2004, in Colorado, the State Auditor released a performance audit of the state Department of Transportation's contract management practices for engineering, design, and construction work on public bridge and highway projects. Among other conclusions, the audit found that the Transportation Department does not manage the consulting firms properly, including conducting adequate reviews of indirect costs on consultant contracts, including salaries and benefits for the executives of the consulting firms. The report recommended that the Transportation Department consider the companies' past performance when selecting consultants for projects.[68]

III. State Departments of Transportation Outsourcing, Downsizing, and Brain Drain

- ***Over the past decade, state departments of transportation have boosted their budgets by 56%, mostly with federal funds. But they have cut their staffs by 5.3%.***
- ***Then they say, "We don't have the staff" to do engineering, design, and inspection work.***
- ***"Top officials" in Texas "fear the Transportation Department is locked into a cycle that serves the consulting industry much better than the taxpayers."***
- ***As the baby-boom generation prepares to retire, will depleted departments of transportation be able to recruit the next generation of engineers?***

While increasingly relying on private engineering and design consultants, state departments of transportation are freezing or even downsizing their own professional staffs.

In a 1999 survey of organizations representing engineering and technical employees of state transportation departments, more than half the states reported no new hirings, and 25% had implemented layoffs.[69] These findings were confirmed by the magazine ***Public Roads***, which reported in 2001 that "Over the past decade, full-time employment in the state departments of transportation, on average, has decreased by 5.3%, while department budgets have increased by 56%" – a statistic that suggests that much of the increased funds have gone to private contractors and consultants. With "more work for the private sector," this article continues, "state agencies [are] in direct competition with commercial companies for a limited supply of workers."[70]

The journal "Public Roads" found state agencies [are] in direct competition with private companies for a limited supply of workers.

Similarly, in a study in 1998 entitled ***The Changing State DOT***, the American Association of State Highway and Transportation Officials (AASHTO) noted that "almost every member department reported managed downsizing among significant organizational changes…State DOT's substantially increased their reliance on private sector design and maintenance services, and are outsourcing a wider range of support, including project management, and full facility operations and maintenance."[71]

This trend continued in the new decade. In 2006, the Audits Division of the Oregon Secretary of State's office found that the state's Department of Transportation suffered a brain drain from 2000 through 2004. The State Legislature increased the state's transportation budget by $500 million in 2000 and another $2.5 billion in 2003. Of the $3 billion in new funding, $700 million was to be spent on engineering and design. But the state Department of Transportation did not receive any new funding to hire more engineers. [72]

The result was an increasing use of consulting firms, and, as the audit division's report revealed: "We found the [transportation department] was losing experienced staff to these firms and noted a number of instances in which former department engineers are now working for consultants." For instance, five of seven bridge unit managers left the department to work for consultants, as did four of the original 12 contract administrators for the contracts that the audit division studied in-depth.[73]

A Vicious Cycle: Privatization Feeds on Itself

As outsourcing and downsizing both increase, the result is a vicious cycle, where privatization feeds on itself: Because so much of the most prestigious and best-paying work is going to outside consultants, career employees are leaving state transportation departments, often to go to work for the outside consultants. Meanwhile, because "we don't have the staff to do the work," states are farming out more and more work, often to the very companies that hired engineering and technical employees away from the public sector. All these factors contribute to the "brain drain" from state transportation departments.

This cycle can be seen in state after state. For instance in Texas, as the ***Houston Chronicle*** reported: "Many of the private engineers are former state employees, designing the state's roadway expansions just like they did before. As newly minted 'consultants,' they are making higher salaries and earning 10% to 15% profits for their firms." Observing how outsourcing and the brain drain reinforce each other, the ***Chronicle*** revealed:

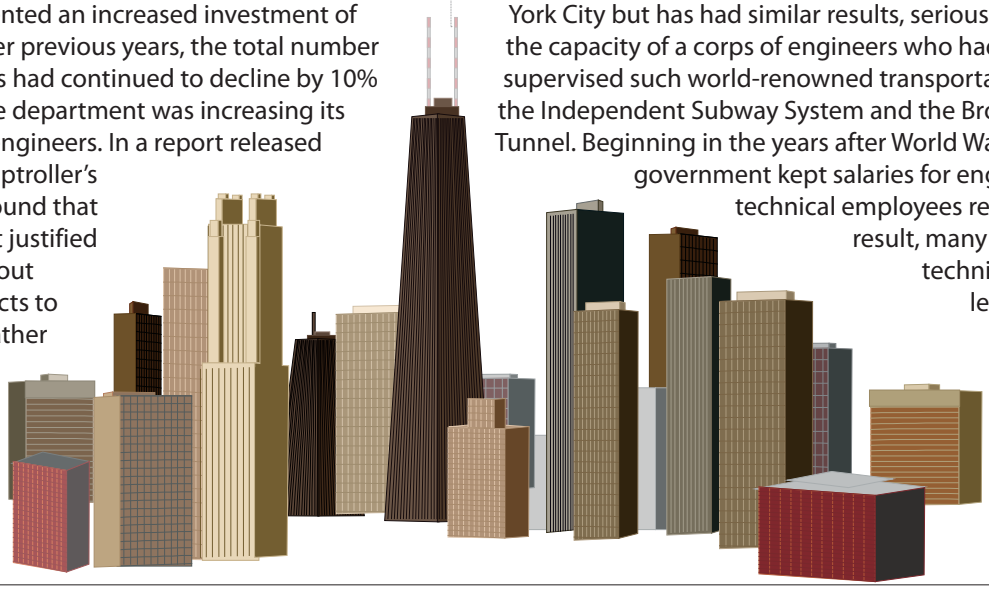
> **"Some top officials fear the Transportation Department is locked into a cycle that serves the consulting industry much better than taxpayers. Private firms seeking work are stealing the best engineers, which in turn causes the state to use even more private firms because fewer state employees are left."[74]**

Meanwhile, in Connecticut, the state Bureau of Engineering and Highway Operations has lost nearly 900 employees from 1990 through 2006. From 1994 through 2006, there have been hiring freezes, two rounds of early retirement incentives, and layoffs during 2003, as well as increases in contracting-out.[75] However, during 2006, after serious problems emerged in the widening of the I-84 highway, a project that was managed by a private firm, Governor M. Jodi Rell announced that the state had authorized the hiring of 75 new transportation engineers to keep more oversight "in house."[76]

New York State: Fewer Staff, More Consultants

In New York State, in response to a 1990 report by the State Comptroller, the Department of Transportation said it planned to hire 672 engineering positions, so that it could complete more design and construction projects with in-house staff.[77]

However, as of 1998, even though the department's capital program represented an increased investment of more than $1 billion over previous years, the total number of engineering positions had continued to decline by 10% from 1995.[78] Instead, the department was increasing its reliance on consultant engineers. In a report released that year, the State Comptroller's office concluded: "We found that the Department has not justified its decision to contract-out more of its capital projects to consultant engineers, rather than hire additional Department staff, as it had agreed to do in 1990."[79]



Three years later, in his 2001-02 budget, the Governor proposed hiring 144 new engineers. But that would only have brought the department back to its staffing level as of 1994 – before TEA-21 and the state's new transportation investments.[80]

Minnesota: A Looming Shortage of Engineers

New York's dwindling in-house engineering staff is a harbinger for other state governments throughout the nation.

For instance, in 2002, the Minnesota Department of Transportation expected that, by 2007, 225 of the 660 engineers on its staff would retire and another 200 would take jobs with private companies because they offer higher pay and better benefits. Meanwhile, the staff of trained technicians who work with the engineers was also expected to decline from 2,300 to 1,512.

With its professional engineering staff dwindling, Minnesota has been outsourcing an increasing share of the design of its transportation projects. Already, in 2001, the state contracted out 54% of the design work on bridge projects. In the past, Minnesota has used consultants mostly for design work, but now it is considering contracting out quality control and contract administration as well, potentially allowing private companies to manage public projects – the sort of arrangement that contributed to delays, overcharges, and construction problems at the Big Dig megaproject in Massachusetts. Without an increase in its engineering staff, the state's assistant transportation commissioner, Dick Stehr, warned in 2002, Minnesota might not be able to do even 50-60% of its projects in-house.[81]

New York City: Losing a World-Class Corps of Engineers

This vicious cycle may have begun differently in New York City but has had similar results, seriously diminishing the capacity of a corps of engineers who had designed and supervised such world-renowned transportation projects as the Independent Subway System and the Brooklyn Battery Tunnel. Beginning in the years after World War II, the city government kept salaries for engineering and technical employees relatively low. As a result, many engineering and technical employees left city government for better opportunities in the private sector. This trend was documented

by the Mayor's Private Sector Survey in 1990, which reported a 15% turnover rate among New York City government's construction managers, superintendents of construction, project coordinators and managers.[82]

This brain drain contributed to the outsourcing of engineering and design work. As the Mayor's Office of Construction reported, very few of the city's large projects are now designed in-house because, "There is insufficient staff to perform the work." This trend, in turn, accelerates the brain drain because there are fewer opportunities for professional advancement when the major projects are done outside. For that reason, in an Architectural/ Engineering Study sponsored by the Mayor's Office of Management and Budget and the Office of Construction, the Arthur Young Company recommended that city engineers should be given large and complex project assignments to enhance their professional status and pride.[83]

USE THEM OR LOSE THEM:

Management consultants recommended that New York City give its in-house engineers important assignments or risk losing them to private companies.

A Looming Crisis: Baby-boomer Retirements

Recruiting and retaining dedicated professionals is becoming even more important for state transportation departments as their current engineering and technical employees approach retirement age. While statistics are not available for the age composition of the workforce in state transportation departments, in a similar workforce – the staff of the Federal Highway Administration – it is reliably estimated that 45% will be eligible for retirement by 2010.[84]

Now that state departments of transportation must attract a new generation of engineering and technical employees or lose their in-house expertise, it is time to decide whether the states will rebuild their capacity to design major projects themselves or rely even more heavily on private consultants.

IV. Who's the Boss? How the Brain Drain in State Transportation Departments and Expanded Roles for Consultants Eliminate Accountability

- ***State transportation departments are losing the capacity not only to do engineering and design but also to oversee the consulting engineers whom they hire.***
- ***In Virginia, a study found that safety inspections were 40% more expensive when consultants were used.***
- ***When inspectors are part of the same team of private consultants who engineer and design projects, they have a hard time being watchdogs for public safety.***
- ***There are even greater risks with "design-build" contracts, where a partnership of private companies designs, engineers, builds, inspects, supervises, and manages an entire project. With these arrangements, who protects the public interest?***
- ***A "dead man's curve" on an Indiana highway demonstrates the dangers of "design-build."***
- ***Fortunately, there's a positive alternative to "design-build" – "design sequencing - fast-track engineering."***

While state departments of transportation are losing the capacity to do engineering and design or even to oversee consulting engineers, private firms are taking on new roles – inspecting, supervising, and even managing the projects themselves. The "brain drain" from state transportation departments and the new responsibilities assumed by private companies are eroding any semblance of accountability in these projects.

These growing – and mutually re-enforcing – trends explain why, in a recent report prepared for the prestigious Transportation Research Board of the National Research Council, two "potential concerns" were expressed about the outsourcing of an increasing array of professional functions. These concerns are:

1) **"DOT's [departments of transportation] may have less control on the quality, time, and cost of their primary functions," and**

2) **"DOT's may lose the skills and expertise to conduct essential functions in-house, or effectively check, evaluate or approve the work of external sources."**[85]

Problems with Inspection by Private Consultants

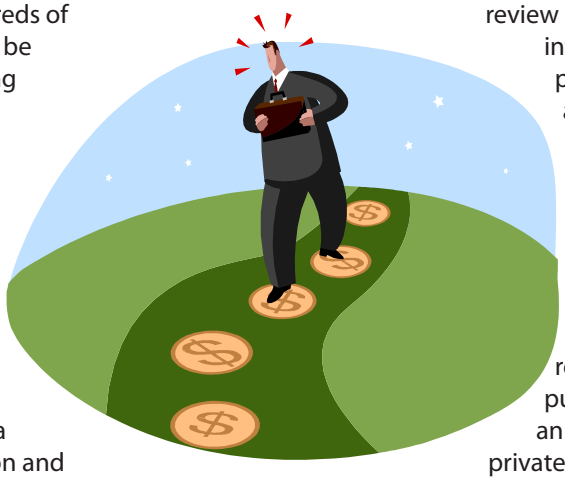
Of the new functions that private firms are performing, inspection carries the risks of increased costs, reduced quality, and compromised safety.

As with other professional functions, inspection has been shown to be more costly – and of no higher quality – when contracted-out to private consultants. For instance, a study by the Virginia Assembly Commission found that bridge safety inspections were 40% more expensive when consultants were used.[86] Similarly, in New Jersey, the state Department of Transportation's Division of Budgeting reported that, with construction inspection and bridge inspection: "…it is most likely cheaper to perform the activities in-house, rather than by consultant. The savings are significant… There are other non-economic factors which also make it desirable to perform these functions in-house such as more responsiveness and lower levels of risk."

Highway Robbery II

Connecticut - I-84: Drains to Nowhere

In Connecticut, faulty inspection work by a consulting firm compounded the construction problems in a $52 million project to widen a 3 1/2 –mile stretch of I-84 between I-691 in Cheshire and Exit 25-A in Waterbury. In October, 2006, the ***Hartford Courant*** reported that the portion of the highway that is being widened is lined with hundreds of defective drains, many of which can only be repaired by excavating and reconstructing sections of the road that have just been rebuilt. These drains are supposed to remove water from the rebuilt roadway, but some of the drains lead nowhere and others are filled with debris. Of some 300 drains in the project, as many as 100 may need to be repaired.[87]



In interviews with the ***Courant***, state transportation engineers said there was a "complete breakdown" of the construction and inspection process. In an internal memo, the chief engineer at the state Department of Transportation's Bureau of Engineering and Highway Operations, Arthur W. Gruhn, concluded: "The numerous types of deficiencies, the particular as well as the general defects and omissions in the work, . . . are stunning."[88]

The project's construction work was done by a private contractor, L.G. DeFelice of New Haven, which went out of business during the winter of 2005-2006. The inspections of the drains and other parts of the project were conducted by a private engineering firm, The Maguire Group of New Britain, which received a $6 million contract for its work on the highway widening. The state fired Maguire in September, 2006.[89]

As the ***Courant*** reported, The Maguire Group has been involved in several other controversial events. In 1991, a former Maguire executive admitted paying a $30,000 "commission" to a bagman for former Waterbury Mayor Jospeh Santopietro in return for a $1 million city contract. In 1995, the firm admitted paying former Meriden City Manager Michael H. Aldi $24,000 for contracts. In 1994, the company removed an executive it said was involved in corruption, and, during the 1990's, Maguire executives testified in cases involving corruption in Boston and in Pawtucket, R.I. [90]

Responding to the problems with the I-84 project, the state government acknowledged that there are problems with the Department of Transportation's internal oversight and inspection procedures and that there is a need for more state transportation engineers. On October 2, 2006, Governor M. Jodi Rell announced that an independent auditor will investigate the failures in the project, as well as conducting a review of the Department of Transportation's internal oversight and inspection processes. The Governor also authorized the hiring of 75 new state transportation engineers to keep more oversight "in house" and limit the hiring of temporary consultants to oversee state projects. [91]

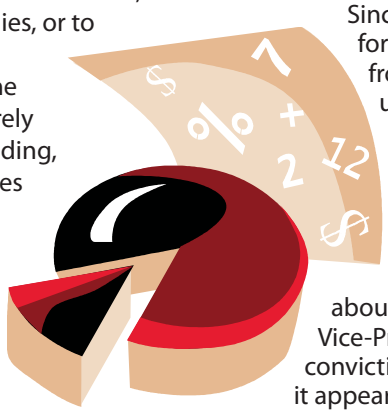
Sometimes, contracting-out inspection has resulted in fraudulent reports that potentially threaten public safety. For instance, in 1998, an x-ray technician who worked for a private company was convicted of falsifying weld inspections on San Francisco Bay Area freeway earthquake strengthening projects. Alvino Rivas had been hired to conduct x-ray examinations of welds used to extend footings of columns on freeways in San Francisco, Contra Costa, and San Mateo County and of welds in and around portions of the freeways. After the Loma Prieta quake, these areas were being re-engineered to bolster the freeways' capacities to withstand future quakes. Rivas later admitted to law enforcement officials that, instead of x-raying all the welds that he had been hired to examine, he had submitted copies of some of the same radiographs. He was sentenced to one year in the San Francisco County jail, placed on probation for five years, and required to pay restitution for corrective work by the California Department of Transportation.[92]

"The numerous types of deficiences, the particular as well as the general defects and omissions in the work, were and are stunning."

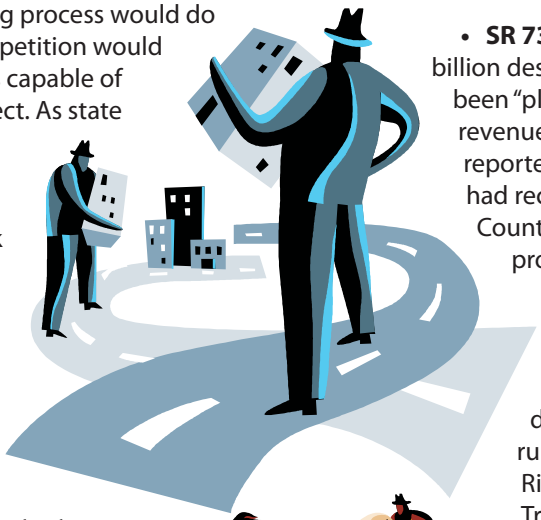
More significant than the cost of the inspections themselves are "non-economic factors" -- the inherent risks in making inspectors the teammates of the private companies that design, build, and often manage the projects. Instead of representing the public interest in safety and quality, the inspectors share the private companies' interests in having their work approved as quickly and as easily as possible. In Section V of this report, the case studies of the Central Artery Tunnel Project in Boston and the Red Line Subway Project in Los Angeles demonstrate the dangers of contracting-out inspection to partners or employees of the private companies responsible for other facets of a project.

Design-Build

Meanwhile, in an even more recent development, states are starting to outsource entire projects, from start to finish, to huge engineering and construction companies, or to partnerships among such companies. "Design/build," as this practice is called, can represent the ultimate in privatization – public agencies entirely entrusting the responsibility for designing, building, managing, and inspecting projects to companies or consortiums of companies so large that it is difficult, if not impossible, to hold them accountable for the cost, the quality, and even the safety of their work.



While design/build is still relatively new, it is not difficult to foresee some of the problems it will produce. The bidding process would do even less to control costs, since competition would be restricted to the large companies capable of performing every function in a project. As state and local governments contract-out entire projects, they would lose the professional capacity and the institutional memory to do the work in-house. And, far from working for public agencies, the large companies conducting these projects would end up managing everything themselves, including the state employees still involved – a situation that emerged with the Central Artery Tunnel project in Boston, which was plagued by constant delays, cost overruns, and construction problems such as leaks in the tunnels.



Already, cost, quality and safety problems are emerging on projects that were constructed under design/build agreements.

California's Design-Build Failures

In California, Governor Schwarzenegger is supporting transportation bills that would replace competitive bidding with design-build procurement. This would allow other, unspecified "non-weighted" factors to be considered "significantly more important than cost" when awarding contracts. In spite of this effort to expand their use, design-build arrangements have been failures for taxpayers and commuters on three important California highways:

- **SR 22 (Garden Grove Freeway)**: Orange County Transportation Authority's design-build project to build twelve miles of car-pool lanes on SR 22 was supposed to have been completed and open in 2006, but work continues in 2007. Since the decision was made to use design-build for the project, the cost more than doubled from $271 million to $550 million! Charges of unfairness in the design-build procurement process have been documented. In an April 7, 2004 story on the SR 22 design-build project, the Orange County Register found "earlier this year two construction firms dropped out of the selection process, partly because of concerns of fairness." In a letter to OCTA about the design-build contracting procedure, the Vice-President of one of those firms wrote, "it is our conviction that it is a process far more subjective than it appears."

- **SR 73 (San Joaquin Hills Tollway)**: This $1.5 billion design-build tollway opened in 1995 and has been "plagued by lower-than-projected traffic and revenue," according to the ***Los Angeles Times***, which reported on November 10, 2005, that the project had received a $1.16 billion bailout from Orange County. Without the emergency assistance, the project would have been in technical default on $1.9 billion in bonds as early as July, 2006.[93]

- **SR 91 (Express Lanes)**: Built in 1995, the design-build, privately owned Express Lanes run through the middle of the congested Riverside Freeway. In 2002, the Orange County Transportation Authority had to buy the tollway because of a typical private toll road non-compete clause that did not allow for improvements on the non-toll lanes. Now, the taxpayers have to pick up the tab for the turnpike's debt of $135 million and pay the company $72.5 million in cash.

The problems with these three projects show that allowing private companies to design, build and operate tollways can delay highway construction and cost the taxpayers tens of millions of dollars more.

Meanwhile, in Indiana, the new eastside ramp that connects 1-465 South to 70 East was supposed to allow more traffic to go through at faster speeds, while avoiding the truck rollover accidents that were all-too-frequent occurrences on the old ramp that it replaced. But, in the first two weeks after

Highway Robbery II

the new ramp opened in November, 2002, three semis rolled over, even though all three drivers were observing the 40 miles per hour speed limit. In response to this extraordinary accident rate, the state Department of Transportation lowered the speed limit to 35 mph and installed more signs and flashing lights. But, over the next eight-and-a-half months, there were six more truck rollovers, without any indications that the drivers were speeding or doing anything else that was unsafe.[94]

In an investigation of the hazardous ramp, WISH-TV in Indianapolis interviewed drivers who said that the curve was dangerous for truckers to negotiate at any speed. One driver said the stretch was especially hazardous if a truck is fully loaded, explaining: "Your wheels are turning. The freight is pushing the back of the tractor to your right as you're going to your left."

The entire $70 million project had been outsourced to a design-build partnership of Walsh Construction and Janssen and Spars Engineering, which Walsh later sued for its work on the project. WISH-TV concluded, "Contracting out project management and oversight compromises quality and safety and leads to finger-pointing."

A Better Way: Design-Sequencing — Fast Track Engineering

In California, the state Department of Transportation has developed a positive alternative to design-build for major state projects. With "Design-Sequencing," design activities are scheduled to allow each phase of construction to begin when the design for that phase of the work has been completed, instead of requiring that the design for the entire project be finalized before construction can begin. Under this system, a contract can be awarded for an entire project with plans that are as little as 30% complete. This allows the contractor to work with state engineers to incorporate innovative construction methods and designs to speed up project delivery and save money. To date, design-sequencing has delivered projects ahead of schedule and under budget in all regions of the state. In fact, projects have been completed an average of 10 months faster compared to following the traditional process.

While it is relatively new, design-sequencing offers two advantages over design-build:

First, instead of entrusting entire mega-projects to one company or one partnership of companies, as happened with Big Dig in Massachusetts, design-sequencing contracts are competitively bid. This ensures that the taxpayers receive the best price on infrastructure – and the funds needed for other transportation projects are not wasted.

Second, design-sequencing provides for state engineers to design and inspect projects, ensuring that the public safety and the public interest are protected. This is preferable to design-build arrangements, where the design, construction, inspection and often the management as well are performed by the same company or consortium of companies. Such a situation eliminates accountability and creates an inevitable incentive to cut corners on quality in order to generate more profits.

V. Case Studies of Contracting-out Design, Engineering, Inspection, and Management

- ***When private companies designed, engineered, built, inspected, and managed major projects in Massachusetts and Los Angeles, there were delays in delivery, cost over-runs, and severe problems with safety and quality.***

- ***Massachusetts' "Big Dig" – the most expensive public works project in history -- had $1.4 billion in cost overruns in 1999 alone, and its costs increased from $2.6 billion to a total of $14.635 billion.***

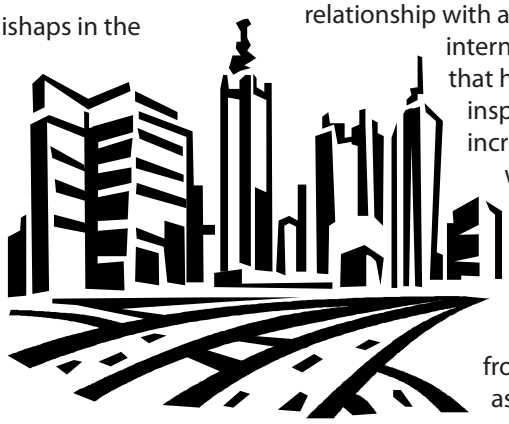
- ***In a Los Angeles subway project, where inspection was contracted-out, the private company's chief inspector pleaded guilty to three felony charges involving counterfeit certificates.***

From an underground highway in Boston to a new subway in Los Angeles, the use of consultants by state and local transportation departments' to design, engineer, inspect, and often manage projects has created serious problems with cost, safety, quality, and accountability.

Massachusetts' "Big Dig"

On July 10, 2006, five three-ton ceiling tiles collapsed in a tunnel under South Boston, crashing down on a car and crushing a woman to death. This accident killed Milena Del Valle, a restaurant worker from Boston who was driving to Logan Airport with her husband, Angel, who was injured. The incident took place in a recently constructed tunnel that connects the Interstate-90 highway to the Ted Williams Tunnel, which leads to the airport.[95]

The tragedy was the worst of many mishaps in the Central Artery Tunnel, more commonly called the "Big Dig," an eight-lane underground highway, as well as ramps and bridges, that runs through downtown Boston and replaces an old elevated highway. The Big Dig has become the most expensive public works project in American history. It has also become notorious for endless delays, cost overruns, and construction flaws that may well have caused this fatal accident and subsequent closings of much of the mega-project. With all these problems, the common denominator is the fact that two huge companies, Bechtel and Parsons-Brinckerhoff, have been jointly designing, managing and inspecting the project with only minimal accountability to the state government of Massachusetts – or anyone else.



Completed in 2005, the project took 20 years to plan, design, and construct – seven years longer than its original schedule. Meanwhile, the project's costs escalated from an original estimate of $2.6 billion to a total of $14.635 billion by 2005, with estimates at the end of that year that the sum would eventually reach $14.7 billion.[96] Rounding out the project's problems, shortly after it was opened, the Central Artery/ Tunnel developed hundreds of leaks in its walls and roof areas, with hundreds of gallons of water gushing out of its sides on at least one occasion. After the ceiling collapse in 2006, even more serious structural problems were discovered.

Private Management: Much of the controversy surrounding the Big Dig has centered around its unusual relationship with a partnership between two large and internationally prominent private companies that have designed, engineered, built, inspected, and directed the project, increasingly melding their own operations with the state agencies nominally responsible for managing them.

In 1985, the state department of transportation solicited proposals for the project, and received some proposals from Massachusetts companies as well as the Bechtel/Parsons-Brinckerhoff consortium. As many other states have done, Massachusetts chose the nationally prominent partnership on the basis of experience, not cost.

The decision to contract-out design, engineering, inspection, and management also reflected the familiar pattern of state departments of transportation (and, in this case, federal officials as well) doubting that they have the in-house capacity to conduct large projects and choosing not to invest in their own staff. As David Luberoff, a Harvard researcher who has written a history of the Big Dig, told the ***Quincy Patriot-Ledger***:

Highway Robbery II

> ***"It was very clear the state lacked the professional capacity to manage a project of this magnitude. The question was, do you try to bring that capacity in-house or do you do what lots and lots of public agencies doing construction projects were doing, and hire out."***[97]

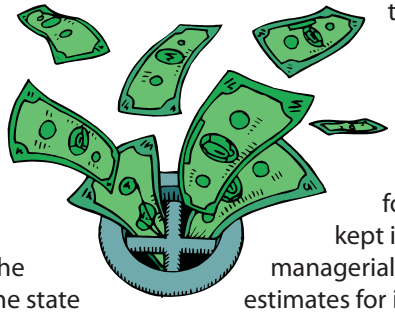
Over the years, as responsibility for the project shifted from the State Highway Department to the Turnpike Authority, the costs of the Bechtel/Parsons Brinckerhoff partnership kept growing along with the partnership's responsibilities and its role in the state agencies that were supposed to be supervising it.[98]

In July, 1997, in a study authorized by the State Legislature to recommend cost savings on the Big Dig, the John W. McCormack Institute of Public Affairs reported:

> ***"The overhead rate for the staff of the Joint Venture is in the neighborhood of 110%. If a position for an employee with an annual salary of $60,000 is eliminated, the savings potential is over $145,000 a year… If a position is transferred to a state agency, the savings might be in the order of $60,000 to $80,000 per year depending on the amount of non-salary expense associated with the agency position."***[99]

Originally, the partnership had been hired for $1.3 million to develop a broad outline for the project. As the contract was revised 14 times from 1985 through 2000, it grew to $1.8 billion, with the two companies writing all the project's contracts, conducting the environmental reviews, and coordinating all the work by Big Dig's contractors. Meanwhile, as of February 2000, 631 of the 748 employees who worked for the project itself were paid by Bechtel/Parsons Brinckerhoff, compared to only 117 who were on the staff of the Turnpike Authority, with many staff members having moved from one payroll to the other.[100]

As with projects in other states that were engineered and designed and even managed and inspected by private companies, the state Transportation Department's capacity to hold Big Dig contractors accountable for the cost and quality of their work has atrophied. Over the years, the state did not include enough money in its budget to hire and retain qualified inspectors to monitor the project's progress. In fact, in 1979, before work on the project began, the Massachusetts Organization of State Engineers and Scientists recommended that the state Transportation Department assign at least 100 state engineers to oversee the work of the private contractors, but the state rejected the recommendation. As the project got underway, the state Transportation Department was "bleeding personnel," as the columnist Alan Lupo wrote in the ***Boston Herald***.[101]



Delays and Cost Overruns: In spite of the experience and expertise that Bechtel/Parsons Brinckerhoff supposedly brought to Big Dig, the project took 20 years to finish and dragged on 7 years longer than originally expected – at an extra cost of more than $12 billion.

Meanwhile, the project's costs were almost five times as much as originally expected. Initially projected at $2.6 billion, the costs spiraled to $14.635 billion by 2005, with additional expenses predicted. Indeed, the only constant in the project's history has been its constantly escalating costs.

In an internal memorandum dated December 24, 2005, the Inspector General of the U.S. Department of Transportation, Kenneth M. Mead, warned that the project's total cost would increase to $14.7 billion.[102]

Why did the Big Dig's costs keep increasing? First, the project kept taking longer to complete. Second, the price tags for construction, design, and management kept increasing. Third, the project became a managerial nightmare, unable to provide adequate estimates for its expenses or to recover the costs of shoddy work.

Over the years and under the management of Bechtel/Parsons-Brinckerhoff, the costs of the entire project, particularly the professional functions outsourced to the two companies, have soared. By April 2000, construction costs had increased by 17% over original bids, while design contracts had skyrocketed by 82%.[103]

Many observers faulted the Bechtel/Parsons-Brinckerhoff consortium for errors in engineering and design that resulted in increased costs. For instance, the Boston Globe reported on April 9, 2000: "The design costs for carrying the turnpike extension under the Fort Point Channel leapt from $24 million to $102 million, in part because Bechtel/Parsons resisted criticism of its own unworkable design."[104] Similarly, the Globe reported:

"At both the South Boston and East Boston approaches to the Ted Williams Tunnel, Bechtel/Parsons ordered work to proceed despite engineers' questions about whether soil conditions would support the planned excavation methods. The result: fixes that cost tens of millions of dollars."[105]

By April 2000, the cost of design contracts for the entire project had skyrocketed by 82%. The design costs for a turnpike extension leapt from $24 million to $102 million.

Finally, poor management and shoddy work created a vicious cycle of delays, cost overruns, and failures to recover the funds that were wasted by earlier errors. Thus, in his December 24, 2005, memorandum predicting further increases in the project's costs, Inspector General Mead cited two management problems. First, there were likely to be shortfalls in how much money the state would recover from contractors for late or shoddy work, including leaky walls and roof areas in the tunnels. Second, earlier estimates had not taken into account the full cost of settling disputes with contractors and maintaining employees to manage the project as it dragged on beyond its scheduled date for completion.

Unfortunately for the people of Massachusetts, they will pay the price as taxpayers and toll-payers. Concerned about Big Dig's ever-increasing costs, Congress has capped the federal investment in the project at $8.549 billion, leaving the Bay State to pick up the tab for the remaining $6 billion or more.

Construction Flaws: In addition to the earlier problems – and even before the collapse of portions of the tunnel's ceiling – important flaws emerged in the project as it approached completion. The most visible and worrisome problems were two different sets of leaks – in the tunnel walls and in the roof-wall joints.

The leaks in the concrete wall panels became evident on September 14, 2004, when a gap opened in one panel, spilling 300 gallons of water a minute onto the tunnel roadway. All in all, there were 102 defective or leaking wall panels, including two that needed major repair, 33 that needed moderate repair, and 67 that needed patching.[106]

Meanwhile, the Massachusetts Turnpike Authority and the Federal Highway Administration had been working for years to repair the roof-wall joint leaks. By the summer of 2004, the Turnpike Authority had counted 724 of these leaks, but, while these leaks were sealed, new ones emerged and sometimes old ones re-emerged, with the result that, by March 22, 2005, there were 662 leaks in need of repair.[107]

These problems paled in comparison with the construction flaws that became apparent after the collapse of the cement ceiling panels that killed Milena Del Valle. As state and federal inspectors examined the tunnels, they learned that the contractors – who were ultimately supervised by the Bechtel/Parsons Brinckerhoff partnership – had cut corners on costs and on quality as well. From the tiles that fell off the ceiling to the bolts that were supposed to hold them down, many parts of the tunnels were accidents waiting to happen.

As the National Transportation Safety Board (NTSB) reported after the fatal ceiling collapse, the Big Dig tunnels were designed with a smaller margin of safety than similar tunnels elsewhere in the United States. Thus, on July 10, 2006, when the bolts fell from a tunnel's ceiling, there was nothing to prevent the concrete tiles from falling down – and landing on the Del Valles' car. [108]

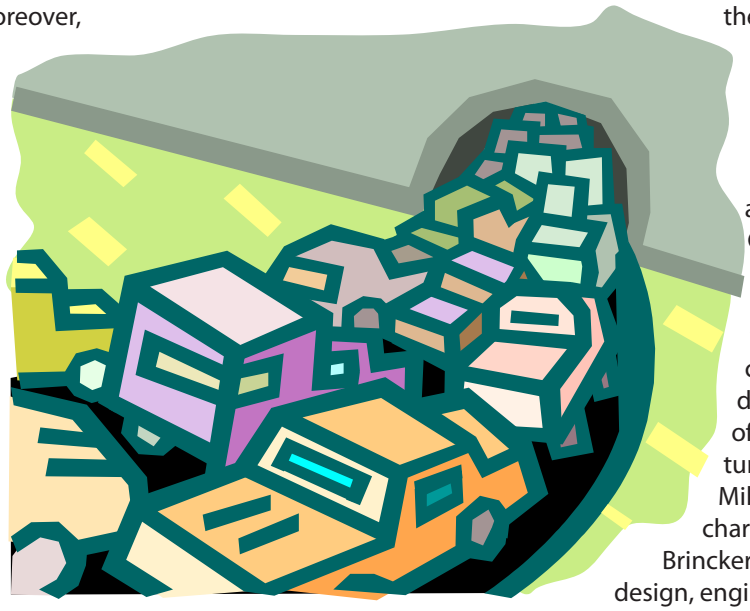
The tunnel had been designed so that the ceiling was held in place by steel hangers. These "tiebacks" are suspended from bolts that are attached to the roof with epoxy glue. But the ceiling was built with only half as many bolts as the original design would have provided, and there were no beams attaching the ceiling to the walls to prevent the roof from collapsing if the bolts fell out, as eventually occurred in the fatal accident. Commenting on the lack of extra precautions, the National Transportation Safety Report concluded: "No redundancy was built into the ceiling in the event the hangers failed. The NTSB has researched other tunnels throughout the country and has found that significant redundancy is built into the ceiling design."[109]

In fact, the project manager, Bechtel/ Parsons Brinckerhoff, persuaded the design firm, Gannett Fleming, to cut in half

Highway Robbery II

the overall number of ceiling bolts that held up the tunnel's ceiling, according to a 1998 memo obtained by the ***Boston Globe***. In yet another apparent example of penny-pinching on safety features, Bechtel/Parsons Brinckerhoff used epoxy bolts to suspend the ceiling, even after they switched from a lightweight material for the ceiling to the less costly but heavier concrete.[110] While the bolts were supposed to be able to hold as much as 30,000 pounds of concrete per square inch, some of them failed to hold even 1,300 pounds. [111]

All this cost-cutting on safety contributed to a growing number of problems in the tunnels. In the aftermath of the fatal collapse, inspectors found at least 60 more "trouble spots" in the eastbound side of the tunnel. Big Dig's project director, Michael Lewis, described these construction flaws as "individual locations where the threaded bolts were used, where something appears to have pulled out and there is somewhat of a gap between the ceiling." Moreover, Lewis acknowledged, there probably were other problem areas elsewhere in the project, including the westbound side of the tunnel and the eastbound high-occupancy lane. [112]



A Continuing Crisis of Accountability: By the summer of 2006, Massachusetts' state government officials finally acknowledged the magnitude of the project's problems. The tunnel where the fatal accident occurred – the Interstate 90 Connector linking the Massachusetts Turnpike with the Ted Williams Tunnel – was immediately closed, and, soon afterwards another section was also shut down after inspectors found that two bolts holding up a concrete ceiling panel had come loose.

Meanwhile, state officials began the most thorough investigations in the Big Dig's history of the project's managers and contractors. Governor Mitt Romney prevailed upon the chief executive of the Massachusetts Turnpike Authority, which is responsible for overseeing the Big Dig, to resign. Romney also asked the State Legislature to give him the authority to oversee the inspection of the defect-ridden ceiling system in the tunnel and to conduct a "stem to stern" safety audit of the entire project.[113] Meanwhile, the state Attorney General, Thomas Reilly, conducted his own investigation, subpoenaing the Big Dig project manager, Bechtel/Parsons Brinckerhoff, as well as the contractor on the connector, Modern Continental.

But, even while Romney and Reilly were criticizing Bechtel/Parsons Brinckerhoff for faulty management of the Big Dig, the state Transportation Department approved $8 million in additional payments to the partnership to keep them overseeing the remaining construction work as well the repairs on the project. By October, 2006, about 100 Parsons/Brinckerhoff employees were still working as consultants to the Big Dig and being paid by the hour. Only after the partnership's continuing work on the project was publicly revealed by a state engineer who took the story to the ***Boston Globe*** did Governor Romney order the state Highway Department to stop using Bechtel/Parsons Brinckerhoff for inspections of the repairs.[114]

On November 27, Reilly announced that the Attorney General's office would file a lawsuit against the Bechtel/Parsons-Brinckerhoff joint venture, as well as 14 other companies involved in the design and construction of the ceiling in the Big Dig tunnel that collapsed and killed Milena Del Valle. The lawsuit charges that Bechtel/Parsons-Brinckerhoff, which coordinated the design, engineering and inspection, was "grossly negligent" in doing unsafe work.[115] Meanwhile, a separate criminal investigation was underway, and a grand jury was preparing to decide whether criminal charges as serious as manslaughter would be brought.[116]

Costly Lessons: As Big Dig became mired in lengthy delays, excessive costs, and flawed construction – even before the ceiling collapse on July 10, 2006 -- several state and federal agencies investigated what had gone wrong. Their conclusion: The unusual partnership between the state Turnpike Authority and Bechtel/Parsons-Brinkerhoff -- and the outsourcing of the management, engineering, and design – had made it almost impossible to hold the project accountable for its cost and quality.

In a report released in December 2000, the Inspector General of Massachusetts explored the project's difficulty in recovering costs resulting from unsatisfactory performance by its contractors. This report found that "Bechtel/Parsons-Brinckerhoff's overly broad role in Project management undermines the Commonwealth's ability to hold Bechtel/Parsons-Brinckerhoff accountable for its design work."[117] As the manager of the project, the consortium has an inherent conflict of interest when it considers whether to recover excessive costs from itself for work that it may have improperly designed, managed, or inspected. Therefore, the report recommends that the state "Delink the Bechtel/Parsons-Brinckerhoff and MassPike [Turnpike Authority] organizations."[118]

As the Massachusetts Turnpike Authority tried to recoup the costs of repairing faulty work, the agency hired retired Judge Edward Ginsburg to direct the recovery effort. He accused the project's managers of concealing the fact that the tunnel had hundreds of leaks and eventually released a report contending that state officials had placed too much trust in Bechtel/Parsons-Brinckerhoff. "They were all married to each other," he declared in frustration.

On the federal level, the Inspector General of the U.S. Department of Transportation recommended in 2004 that the cost recovery effort be removed from the control of the Massachusetts Turnpike Authority because the state agency "lack[ed] the independence needed to pursue cost recovery efforts against Bechtel/Parsons, its partner."

Massachusetts Inspector General: "Bechtel/ Parsons-Brinckerhoff's overly broad role in management undermines the Commonwealth's ability to hold Bechtel/Parsons Brinckerhoff accountable for its design work."

Testifying before the Committee on Government Reform on April 22, 2005, Inspector General Mead explained that the partnership between the state agency and Bechtel/Parsons-Brinckerhoff "was intended to make management more efficient, but it hindered the Authority's ability to oversee Bechtel/Parsons, because the authority and Bechtel/Parsons had effectively become partners in the Project."[119] For instance, in the aftermath of the incident where hundreds of gallons of water gushed through a gap in the wall panels, the Inspector General observed that the state agency's "inability to recover any of these costs may be due at least in part to its partnering relationship with Bechtel/Parsons."[120]

In words that echo well beyond Boston, the Inspector General concluded that the Big Dig, with its privatization of every aspect of every major function, "presents many lessons in how not to manage a public works megaproject."

Los Angeles' Red Line Subway

Built during the 1990's – and riddled right from the start with dangerous and costly construction problems – Los Angeles' Red Line subway is a case study of the hazards of outsourcing an entire project.

As with similar projects, a private construction firm, Tutor-Saliba, was hired to build the project. But other functions were privatized as well with Parsons-Brinckerhoff designing it, and Parsons-Dillingham receiving at least $170 million to oversee the construction and inspect the project.[121] This near-complete privatization made it difficult for the Metropolitan Transportation Authority (MTA), which had commissioned the project, to hold the contractors accountable for the cost, quality, and safety of their work.

After the ***Los Angeles Times*** reported that many sections of the concrete tunnels were built thinner than the design required, the MTA hired two teams of specialists to investigate the construction and inspection of the project.

In a 1994 study of the quality of the construction, a team of two engineers and a former tunnel company executive found areas of thin concrete, air pockets, and missing reinforcing steel in the tunnel walls.[122]

Meanwhile, a law firm specializing in engineering issues investigated the performance of Parsons-Dillingham. Finding lax enforcement of construction requirements for the project, the law firm Barba Arkon International released a report finding extensive shortcomings in the management and inspection of the project, concluding: "These deviations from written procedures are at variance with what is considered acceptable industry practice."[123]

Later in 1994, after some sections of Hollywood Boulevard above the subway line started sinking, new problems were discovered with the design, construction, and management of the subway line. The ground was sinking by as much as nine inches because, during the construction of the subway tunnels, wood wedges had been used instead of sturdier steel bracing.

Highway Robbery II

In other problems revealed at this time, instead of concrete, the construction contractor had used plywood, odd-sized blocks of wood, paper sacks, and other unreliable materials to fill tunnel joints.

Once again, the design engineers, Parsons Brinckerhoff, and the management and inspection consultants, Parsons-Dillingham, were criticized for allowing and reviewing the substitution of wood wedges for steel struts. The inspectors were further faulted for devoting "little attention" to construction specifications for the tunnel joints.[124]

Responding to these revelations, MTA Board member and Los Angeles County Supervisor Edmund Edelman condemned the construction contractor and the inspection and management consultants, declaring:

> **"It is deeply shocking to discover that the tunnel contractor apparently disregarded an important safety feature of the contract, even after they were warned on noncompliance. It is even more dismaying to learn that the construction management firm has neglected to properly inspect this portion of the work for an entire year."[125]**

Three years later, a worker on the project was seriously injured when a several-hundred-pound concrete slab broke off from a wall of the tunnel, crushing his hip and pelvis. This incident prompted the ***Los Angeles Times*** to examine occupational injury reports, which showed that the injury rate on the Red Line's Santa Monica Mountains Tunnel was at least 60% higher than the national average for such projects.[126]

As problems continued to mount by 2000, the United States Attorney sued another inspection company, Twining Laboratories for millions of dollars, charging shoddy and fraudulent inspections of defective welds at Red Line stations. Meanwhile, federal prosecutors disclosed that the company's former chief inspector had pleaded guilty to three felony charges involving counterfeit certificates for welding inspectors who had not been properly trained and tested.

Private management and inspection consultants were faulted for devoting "little attention" to construction specifications.

Before the subway stations were opened to passengers, bad welds were discovered in the simulated-rock ceiling above the passenger platform at the Vermont and Beverly station and in the large diagonal canopy over the entrance to the Vermont and Santa Monica Station. Assistant U.S. Attorney Jeffrey Ravitz said: "Had it not been discovered, there was a serious risk that people who use the subway could have been injured."[127]

VI. A First Step: Accountability in Contracting

In 2005, Congress addressed the challenge of investing in the nation's transportation needs by providing $286 billion over five years for highways, bridges, mass transit systems, and similar projects. But, unfortunately, Congress did not address the challenge of providing what these projects lack: accountability for how the taxpayers' money is spent on private consultants. Indeed, the appropriations bill for the 2006 fiscal year, which fully funds the recently renewed federal transportation program, makes it more difficult for state departments of transportation to hold their consultants and contractors accountable for the cost and quality of their work by conducting audits of these outside firms and their work on state projects.

Now is the time to address the issue of accountability at the federal and state levels. Because of the excessive costs, uneven quality, and safety hazards in many transportation projects designed, managed, and inspected by private consultants, there is a growing demand for greater controls over whether and how federal funds are used to hire private consultants.

While there is much room for debate over how to set standards for "accountability in contracting," one model is for Congress to enact legislation similar to H.R. 1980 (Cheeks-Kilpatrick, D-MI), the Safety, Accountability, and Funding Efficiency for Transportation (SAFE-T) Act, introduced in the 109th Congress. This essential legislation will ensure taxpayers receive safe, high quality transportation services at the best possible price by requiring states and local transportation agencies to prepare a cost-benefit analysis, and assess the past performances of contractors, prior to contracting for services.

Specifically, SAFE-T requires government agencies to prepare:

Cost-Benefit Analysis for any private contract proposed to utilize $100,000 or more of federal funds. The analysis must outline the cost of doing the proposed work by private contract or with government agency employees and assess the potential impacts on project delivery and public safety.

Performance History of the private contractor proposed to receive a contract, including a description of previous work performed for government agencies and an assessment of whether the contractor has delivered government projects safely, on schedule and within budget.

SAFE-T's accountability provisions would not apply when the work is of an emergency, specialty, or intermittent nature. SAFE-T also allows government agencies to use the federal Brooks Act, their own qualification-based criteria, or any other fair, competitive procurement process.

SAFE-T requirements could trigger positive practices by state and local transportation departments:

- Not hiring private firms to do engineering and similar professional work that in-house engineers can do just as well and less expensively;
- Making careful cost comparisons between in-house engineers and consultant engineers;
- Becoming more cost-conscious in their dealings with private consultants;
- Thinking twice before hiring consultants to do inspection, supervision, and management – all of which are functions where contracting-out further erodes accountability for cost, quality, safety, and timely completion of projects;
- And rebuilding the career professional staffs of state transportation departments, rather than relying ever more heavily on private consultants.

Highway Robbery II

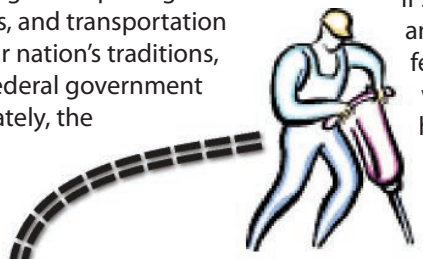
Approving an "accountability in contracting" requirement would lead the federal and state governments to reduce the costs and improve the safety, quality, and timeliness of transportation projects. And serious consideration of this proposal would prompt debate in the Congress and among other decision makers, opinion leaders, and concerned citizens about how to correct the problems that have arisen when engineering, design, inspection, supervision, and management of these projects are outsourced.

While Congress has yet to act on the issue of accountability, several state legislatures are addressing this challenge. In Oklahoma in 2003, the State Legislature approved and Governor Brad Henry signed a new "Accountability in Contracting Law" that requires state agencies, including the Department of Transportation," to prepare a cost-benefit analysis before outsourcing a state function. Wisconsin also has enacted a requirement that the state Department of Transportation must conduct a cost-benefit comparison before contracting-out work that would ordinarily be performed by state employees. In Connecticut, the Legislature passed a similar bill, but, unfortunately, it was vetoed by Governor Jodi Rell. Meanwhile, in New York, in 2006, the Legislature passed and Governor George Pataki signed a slightly different law that requires state agencies, including the Department of Transportation, to produce annual reports identifying their consultants, the work they performed, and the fees they were paid, as well as revealing whether there was competitive bidding for the contracts.[128]

Supreme Court Justice Louis Brandeis called the states "the laboratories of democracy" because they can institute initiatives that are eventually adopted on the national level. By enacting laws that require transportation departments and other agencies to make sure that outsourcing helps control costs, ensures public safety and protects quality, state governments can once again be laboratories of democracy and incubators of accountability.

Conclusion

As the 21st Century begins, the United States has wisely begun an ambitious program of building and repairing highways, bridges, mass transit systems, and transportation projects of all kinds. In keeping with our nation's traditions, this program is largely funded by the federal government but conducted by the states. Unfortunately, the federal government is actually making it more difficult for the states to hold engineering and design consultants accountable for the cost and quality of their work.



Now is the time to debate and decide how Americans can get real value from our increasing investments in transportation projects. In particular, there is the need to institute and enforce real accountability for how state transportation departments hire consultants to do engineering and design work on federally funded projects and, more and more often, to inspect, supervise, and manage these projects as well.

The first focus of this discussion should be proposals for "accountability in contracting" that have been proposed in Congress but, unfortunately, have not been enacted. One model is an amendment that was proposed in 1997 to the Highways Appropriations Bill that would have required that, before state transportation departments hire outside consultants for engineering and related functions, they must conduct cost-benefit analyses showing that outsourcing would result in substantial cost savings that would not be outweighed by the public's interest in having these functions performed by career public employees.

Meanwhile, Congress must not make the same mistake twice. The appropriations bill for the next year of funding for the new SAFETEA-LU federal transportation program should not include the harmful provision in the appropriations bill for the 2006 fiscal year, which makes it more difficult for state departments of transportation to hold their consultants and contractors accountable for the cost and quality of their work by conducting audits of these outside firms and their work on their projects.

While it is not a cure-all for all the issues involving the cost, quality, safety, and timely delivery of transportation projects, an "accountability in contracting" requirement would have averted many of the problems described in this report and would promote greater discussion and eventual action about other concerns as well.

If states were required to conduct cost-benefit analyses before hiring consultant engineers for federally funded transportation projects, there would be fewer instances of private firms being hired to do work that state engineers could do just as well and much less expensively. There would be fewer privately engineered projects such as those described in this report with cost overruns, delays in completion, and serious safety hazards. And, because state transportation departments could no longer rely routinely on consultant engineers, they would need to do more to retain state engineering and technical employees and recruit qualified professionals as older workers retire.

While Congress has yet to address the challenge of increasing the accountability of engineering and design consultants for the cost and quality of their work, several state legislatures have begun to take action on this issue. State "accountability in contracting laws" not only save the taxpayers' money in the jurisdictions that enact them but also create a groundswell for national action.

The facts presented in this report support the need for greater accountability in how federal transportation funds are spent by state transportation departments and the consultants whom they hire:

- **Contracting-out is growing uncontrollably**: Unless they are required to justify their use of consultants, state transportation departments will continue to outsource more and more engineering and design, as well as other functions such as inspection, supervision, and management. From 1998 to 1999 alone, contracting out rose from 35% to 42% of state preliminary engineering expenditures throughout the nation, and the use of consultant engineers has increased even more dramatically in several major states – going up by 2,650% in New Jersey over the last ten years and by 720% in Texas from 1994 through 1999. But, until they are called upon to conduct cost-benefit analyses before contracting out engineering and similar professional services, state transportation departments will keep taking the easy way out: giving the appearance of holding the line on payroll costs by freezing or cutting their engineering staffs, while relying ever more heavily on consultants.

Highway Robbery II

• **Consultants cost more than state engineers**: Conducting cost-benefit analyses will also call attention to the inescapable fact that outsourcing costs more than making use of state engineering and technical employees. More than 80% of comparative studies have found that contracting-out engineering, design, and inspection costs more than do this work in-house, and none of these studies found that consultant engineers were less expensive. Factors that contribute to consultants' excessive costs include the lack of competitive bidding, cost-plus provisions in their contracts, salary differentials between the private and public sectors, profit margins of from 10% to 15%, and additional costs connected with selecting and supervising outside consultants.

• **Soon the brain drain from state transportation departments will be irreversible**: Skilled and dedicated professionals have been leaving state governments for the private sector because salaries are higher and career opportunities are greater, especially because transportation departments have been reducing their staffs, holding down their pay, and contracting-out the most interesting work. Consulting firms are actively recruiting state engineers who then solicit contracts from their former colleagues. Now that the "baby boom" generation of state engineers is preparing to retire, state transportation departments have one last chance to recruit and retain a new generation of professionals in public service – or else they will soon have no choice but to contract-out engineering at ever-increasing costs to the taxpayers.

• **Private firms are moving towards a total take-over of public projects**: If new forms of accountability are not imposed now on state transportation departments and their consultants, private firms will move towards a total take-over of every facet of public projects – and soon there will be no accountability at all. Private firms are seeking and obtaining contracts not only to engineer and design but also to inspect, supervise, and manage transportation projects. When the same companies or a team of companies performs all these functions, there is no accountability to the public and there is the potential for the delays, cost overruns, and safety hazards that occurred in Boston's "Big Dig" and Los Angeles' subways.

In addition to including "accountability in contracting" requirements in federal legislation , other steps should be taken to promote safety, quality, economy, and responsibility in transportation projects:

• **More Responsible Contracting Procedures**: Much of the current process for picking and paying consulting firms – particularly the lack of competitive bidding and the cost-plus contracts – is an invitation to overcharges and abuse. Private consultants should be hired only when state engineers cannot do the job, or when a cost-benefit study has demonstrated that outsourcing is less expensive than doing the work in-house. Once the decision has been made to contract-out the work, cost comparisons should be part of the process of selecting which private firm to use. State transportation departments should also avoid cost-plus contracts that reimburse private firms for any and all expenses that they claim. Instead, there should be a thorough review of consultants' expenses to make sure that these charges are legitimate and to encourage the consultants to be more cost-conscious.

• **More Oversight by State and Federal Authorities**: As the Inspector General of the U.S. Department of Transportation, Kenneth M. Mead, testified before the Committee on Government Reform of the U.S. House of Representatives, the problems with Massachusetts' Big Dig mega-project resulted in large measure from a failure of oversight by the state and federal governments. Particularly if a state agency enters into a "design/build" partnership, as the Massachusetts Turnpike Authority did, it should arrange for some sort of independent oversight similar to that which Judge Edward Ginsburg eventually provided. Similarly, as Mead recommended, the Federal Highway Administration should conduct regular audits of major state projects that receive federal funding, rather than automatically approving their plans.

• **More Legislative Scrutiny**: State Legislators should also take a closer look at the use of consultant engineers by state transportation departments. Legislators should not accept the budgetary sleight-of-and that allows state transportation departments to claim to be holding down their payroll costs because they have frozen or cut the number of full-time employees while also contracting with consultants who cost more than state engineers. Legislators should also reject special-interest legislation sponsored by the consulting industry, such as the Texas law that actually mandates that a fixed percentage of the state transportation budget must be devoted to private engineering firms.

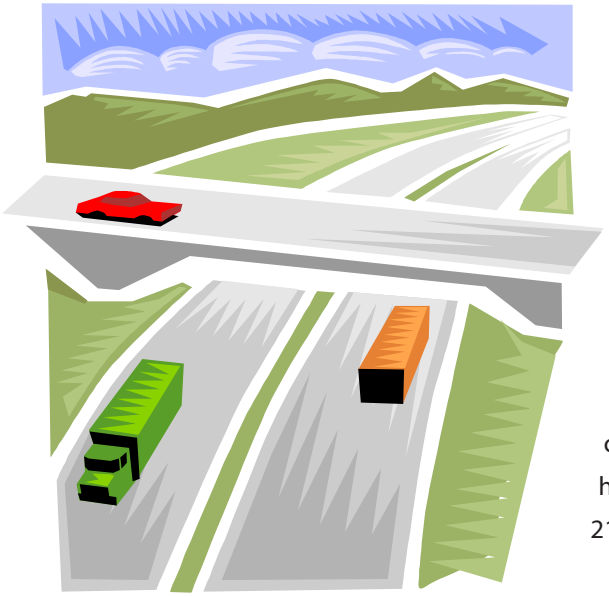
• **Reforming Campaign Finance and Enforcing Government Integrity**: At the national, state, and local levels there should be limits upon how much money companies that receive government contracts, and their executives and employees, can contribute to political campaigns. Public officials who are responsible for awarding government contracts should be prohibited from hosting or issuing invitations to fundraising events. Companies seeking government contracts should be required to disclose their political contributions. And members of the U.S. Congress, the state legislatures, county boards and city councils should be

vigilant in watch-dogging whether government contractors and consultants have contributed to the campaigns of the public officials who award them their contracts.

- **Rebuilding State Engineering Workforces**: Now that the "baby boom" generation is preparing to retire, state transportation departments need to take action to retain existing engineering and technical employees and to recruit skilled and dedicated professionals to take the place of those who are leaving. Reversing the "brain drain" from state transportation departments will require offering salaries that are competitive with the private sector, assigning some of the most interesting projects to state engineers, and recognizing and rewarding the commitment of skilled professionals who have chosen careers in public service.

- **Keeping Inspection and Oversight In-House**: Inspecting and overseeing transportation projects are functions that should be performed by state engineering and technical employees who are guardians of the people's safety and the taxpayers' money, not by private consultants who are team-mates with the firms that engineered and designed the projects. State transportation departments should keep functions such as inspection and oversight in-house and reject the attempts by private companies to take over all the functions connected with designing, engineering, inspecting, supervising, and managing public projects. State transportation departments should also avoid compromising relationships such as developed in Massachusetts' "Big Dig," where state employees were expected to be team players and at times were even supervised by employees of a partnership of private companies that managed the project.

- **Experimenting with "Design-Sequencing:** "Design-Sequencing" offers two advantages over "design-build": First, instead of entrusting entire mega-projects to one company or one partnership of companies, as happened with Big Dig in Massachusetts, design-sequencing contracts are competitively bid. This ensures that the taxpayers receive the best price on infrastructure – and the funds needed for other transportation projects are not wasted. Second, design-sequencing provides for state engineers to design and inspect projects, ensuring that the public safety and the public interest are protected. This is preferable to design-build arrangements, where the design, engineering, construction, inspection and often the management as well are performed by the same company or consortium of companies. Such a situation eliminates accountability and creates an inevitable incentive to cut corners on quality in order to generate more profits.



Together with "accountability in contracting" provisions at the federal and state levels, these initiatives will ensure that the nation's essential investments in transportation projects will reap the maximum returns to the taxpayers. When the federal government, state transportation departments, local communities, and, when necessary, private companies make responsible use of public funds, the nation will benefit from building and repairing our highways, bridges, mass transit systems, and other transportation facilities. Just as with the wise choices that created our nation's canals, railroads, and interstate highways, sound decisions today will build a better America for the 21st Century.

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- AFSCME Council 13 (Harrisburg, PA)
- AFSCME District Council 48 (Milwaukee, WI)
- AFSCME Local 375 DC 37 (New York, NY)
- AFSCME Local 882 (Milwaukee, WI)
- AFSCME Minnesota Council 5 (St. Paul, MN)
- Alaska Public Employees Association/AFT (Juneau, AK)
- AFT Public Employees (Washington, DC)
- Association of Engineering Employees of Oregon (AEE) (Salem, OR)
- Communications Workers of America (CWA)(Washington, DC)
- Communications Workers of America Local 1032 (Trenton, NJ)
- Connecticut State Employees Association (CSEA), SEIU Local 2001 (Hartford, CT)
- Council of Engineers and Scientists Organizations (CESO)
- CSEA Local 1000, AFSCME (Albany, NY)
- Department for Professional Employees, AFL-CIO (Washington, DC)
- International Federation of Professional & Technical Engineers Local 17 (Seattle, WA)
- International Federation of Professional & Technical Engineers Local 21 (San Francisco, CA)
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- Maine State Employees Association/SEIU Local 1989 (Augusta, ME)
- Massachusetts Organization of State Engineers and Scientists (M.O.S.E.S.) (Boston, MA)
- Michigan Public Employees SEIU Local 517M (Lansing, MI)
- Minnesota Government Engineers Council (MGEC) (St. Paul, MN)
- Montana Public Employees Association (Helena, MT)
- New York State Public Employees Federation (PEF), AFL-CIO (Albany, NY)
- OCSEA/AFSCME Local 11, Chapter 2513 (OH)
- Ohio Civil Service Employees Association (AFSCME), Local 11 AFL-CIO (Westerville, OH)
- Oklahoma Public Employees Association (OPEA) (Oklahoma City, OK)
- Professional Engineers in California Government (PECG) (Sacramento, CA)
- SEIU Local 285 (Roxbury, MA)
- SEIU Local 503, Oregon Public Employees Union (Salem, OR)
- Service Employees International Union (SEIU) (Washington DC)
- State Highway and Transportation Employees Association of Missouri (Jefferson City, MI)
- Teamsters Local Union No. 916/IBT (Springfield, IL)
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