Highway Robbery

How Contracting-Out the Design, Engineering, Inspection & Management of Federally-Funded Transportation Projects Produces Problems with Cost, Quality, Safety & Accountability

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

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 29 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

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TABLE OF CONTENTS

EXECUTIVE SUMMARY executive summary

- The nation is making large-scale and long-overdue investments — $217 billion in federal funds over six years — in highways, bridges, mass transit systems, and similar projects.

- There must be real accountability for how this huge amount of federal money is spent by state and local departments of transportation.

- The contracting-out 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 contracting-out engineering and similar functions costs more than doing the work in-house.

- Contracting-out can be part of a budgetary shell-game: state and local transportation departments are freezing or cutting their engineering and technical staff, while contracting-out increasing amounts of work.

- 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 contracting-out 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 adopt "accountability in contracting" provisions requiring state and local transportation departments to conduct cost-benefit studies before contracting out engineering and similar services on federally funded projects. The nation needs to make sure that the taxpayers get their money's worth for the essential investments Americans are making in transportation.

Encouraged and assisted by a major federal program — the six-year, $217 billion Transportation Equity Act for the Twenty-First Century (TEA-21)[1] — state and local governments are making large-scale and long-overdue investments in highways, bridges, mass transit systems, and similar projects.

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.

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.

Consultant Costs Skyrocketing

Using this large and growing pool of federal funds, state and local transportation departments are dramatically increasing the amount of engineering and design work they contract-out to private consultants, rather than relying on their own engineering and technical employees. From 1998 to 1999, the first years of the TEA-21 program, contracting-out increased from 35% to 42% of state preliminary engineering expenditures[2]. In several states, the costs of consultant engineers have increased exponentially, growing by 2,650% in New Jersey over the last ten years[3] and by 720% in Texas from 1994 through 1999[4].

Meanwhile, many of the projects whose engineering and design work was contracted-out 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[5]. 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.[6]

Budgetary Shell-Game

Contracting-out is attractive to many state and local 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[7]. 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.[8]

Why Consultants Cost More

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%[9], 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.[10]

More than 80% of comparative studies have found that contracting-out engineering, design, and inspection costs more than performing these functions in-house.

Brain Drains from State Transportation Departments

Moreover, the growing out-sourcing 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, contracting-out 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 and local departments of transportation and the engineering and design firms that they hire with federal funds more accountable to the taxpayers whom they serve. As Congress considers reauthorizing TEA-21, an amendment has been offered that would require government agencies 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 inspections.

This proposal would not eliminate the contracting-out of engineering and design work when it is the most efficient way to carry out transportation projects. It 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 government 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 contracting-out of design, engineering, and related work on federally funded transportation projects;

2. The growing body of research suggesting that contracting-out 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 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 management and inspection — were contracted-out in major projects in Massachusetts and California.

6. And a proposal that has been presented in Congress to ensure that taxpayers receive safe, high quality design and related transportation services at the best price by requiring transportation departments to prepare a cost-benefit analysis before contracting with private design consultants for work on federally funded projects.

This report was commissioned by the National Association of State Highway and Transportation Unions (NASHTU), a coalition of 29 unions and associations representing hundreds of thousands of transportation engineers, construction managers and inspectors, technical employees, and related public servants in state and local governments throughout the nation. While this report draws upon these employees' experiences, it relies more heavily upon studies commissioned by 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 $36 billion a year for urgently needed state transportation projects. The taxpayers need to make sure they're getting the most for their money – much of which goes to engineering and design.

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

- Contracting-out can be a fiscal shell game. 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 contracting-out work when the available empirical evidence suggests that contracting-out 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.

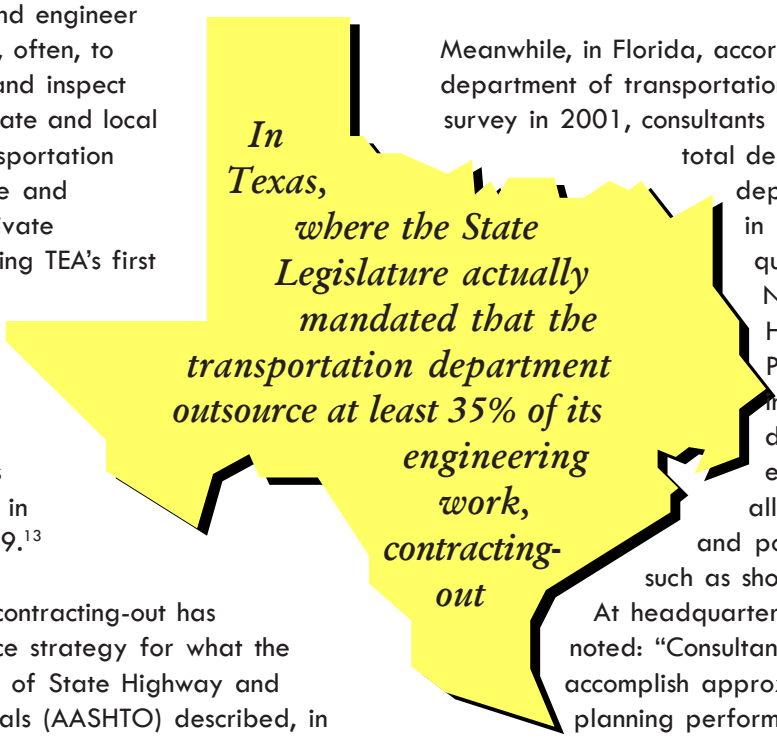
Now, as the Twenty-First Century begins, the nation is engaged in a program of building, repairing, and maintaining its transportation infrastructure as ambitious as these earlier efforts. Passed by both Houses of Congress and signed into law by President Clinton in 1998, the Transportation Equity Act for the Twenty-First Century (TEA-21) is the largest federal public works program in the nation's history.[11]

Authorizing $217 billion in federal funds through Fiscal Year 2003, the 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 exceeds $36 billion a year – represents an increase of 40% over the resources provided by its predecessor program, the Intermodal Surface Transportation Efficiency Act (ISTEA).[12]

Encouraged and assisted by TEA-21, 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 Contracting-Out

In order to design and engineer these projects – and, often, to manage, supervise, and inspect the work as well – state and local 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.[13]



In state after state, contracting-out 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)."

For instance, in New Jersey, the contracting-out 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.[14]

The contracting-out 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%.[15] 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.[16]

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.[17] 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."[18] 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."[19] 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."[20]

Outpacing even Texas, Florida, and New Jersey are five states that contract-out virtually all of their preliminary engineering work: Illinois, Indiana, Iowa, Louisiana, and Rhode Island.[21] Indiana has virtually privatized the entire function, contracting-out 99% of its preliminary design work.[22]

While federal, state 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 Sleight-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 contracting-out.

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.

Two studies of the outsourcing of design and engineering work on transportation projects support this explanation of why contracting-out 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 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."[23]

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."[24]

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. [25]

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."[26]

The New Jersey Department of Transportation paid a private company $136,000 to do $10,000 worth of work.

In one of many apparent examples of politically connected companies receiving state contracts, 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. [27]

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 is all too typical of contracting-out.

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: 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.[28]

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%.[29] 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**: The vast majority of state and local 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 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.[30] By 2001, the gap had grown to $84,126 for state engineers and $138,095 for consultant engineers. [31] 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.[32]

■ **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. [33] In a similar finding, the California Legislative Analyst found that overhead amounts to 203% of consultants' total salaries.[34]

■ **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 contracting-out 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 contracted out 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."[35] 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."* [36]

New York State Comptroller: 'State Transportation Department "has not demonstrated that its use of consultant engineers has provided services in a cost-effective manner." Ten of 18 contract-out projects could have been completed by state engineers. Consultant engineers' salaries are up to $20,000 higher than state engineers'.

Major statewide studies 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 continues 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.[37] 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, the State Comptroller's Office released a report in 1998 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." [38]

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."[39]

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. [40]

Higher salaries for consultant engineers were one reason why contracting-out 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.[41]

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 contracting-out was 62% more expensive for eight 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.[42]

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." [43]

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

- Consultant engineers cost an average of $138,095 per year, compared to the annual cost of a state engineer of $84,126; [44]

- The additional administrative overhead and oversight that consultants require would contribute to contracting-out being twice as expensive as having state employees do the work.

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. [45]

Virginia

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

In a 51-page report completed in 1999, the Virginia Department of Transportation (VDOT) found that consultants were charging 45% more than it would have cost state employees to complete 50 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 contracting-out 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.[46]

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.[47]

Wisconsin

In one more evaluation of the costs of contracting-out, 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.[48]

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 and local departments of transportation are freezing or even downsizing their own professional staffs.

In a survey of organizations representing engineering and technical employees of state transportation departments, more than half the states reported no new hires, and 25% had implemented layoffs.[49] 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."[50]

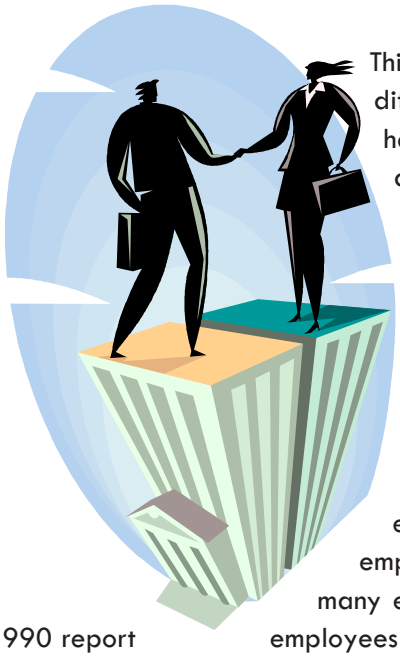
Similarly, in a study in 1998 entitled ***The Changing State DOT***, the American Association of State Highway and Transportation Officials (AASHTO) noted that "almost every member department reported managed downsizing among significant organizational changes…state DOT's substantially increased their 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." [51]

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."[52]



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. [53]

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.[54] 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." [55]

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. [56]

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.[57]

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.[58]

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.

Recruiting and retaining dedicated professionals is becoming even more important for 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 and local 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.[59]

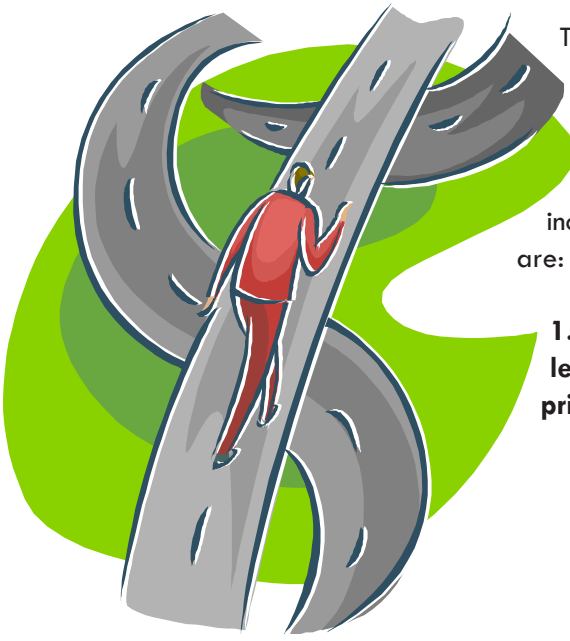
Now that state and local departments of transportation must attract a new generation of engineering and technical employees or lose their in-house expertise, it is time to decide whether state and local governments will rebuild their capacity to design major projects themselves or rely even more heavily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

consultants.

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

- **State and local 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?**

While state and local 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 contracting-out 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."[60]

Inspection

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.[61] 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."[62]

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 inspect, 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.[63]

More significant than the cost of the inspections themselves are "non-economic factors" — the inherent risks in making inspectors the team-mates of the private companies that design, engineer, 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 contract-out 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, engineering, 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.

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.***
- ***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.***

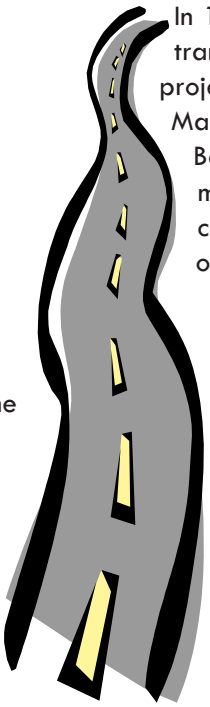
From an underground highway in Boston to a new subway in Los Angeles, the use of consultants by state and local transportation departments to design, engineer, inspect, and often manage projects has created serious problems with cost, safety, quality, and accountability.

Massachusetts' "Big Dig"

An eight-lane underground highway through the middle of downtown Boston, the Central Artery/Tunnel – more commonly called the "Big Dig" – has become the most expensive public works project in American history.

State officials began to prepare plans for the project in 1985, and construction began in 1991. Its spiraling costs have become notorious, with $1.4 billion in cost overruns in 1999 alone.[64]

Much of the controversy surrounding Big Dig has centered around its unusual relationship with a partnership of 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 Big Dig, told the ***Quincy Patriot-Ledger***:

"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."[65]

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. [66]

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."[67]

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.[68]

As State Representative Joseph Sullivan, House Chairman of the State Legislature's Transportation Committee told the ***Patriot Ledger***:

"It's a unique structure that needs to be reviewed … You have a private company that has significant control over the daily operations without a level of public scrutiny that taxpayers should expect."[69]

Over the years and under the management of Bechtel/Parsons-Brinckerhoff, the costs of the entire project, particularly the professional functions contracted-out to the two companies,

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.

have soared. By April 2000, construction costs had increased by 17% over original bids, while design contracts had skyrocketed by 82%.[70] 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."[71]

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.[72]

These and many other cost overruns prompted several investigations by state and federal agencies. Among these studies was a report released in December 2000 by the Inspector

General of Massachusetts exploring the project's difficulty in recovering costs resulting from unsatisfactory performance by its contractors.

This report concluded "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."[73] 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."[74]

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."

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 contracting-out 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.[75] 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.[76]

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."[77]

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.

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.[78]

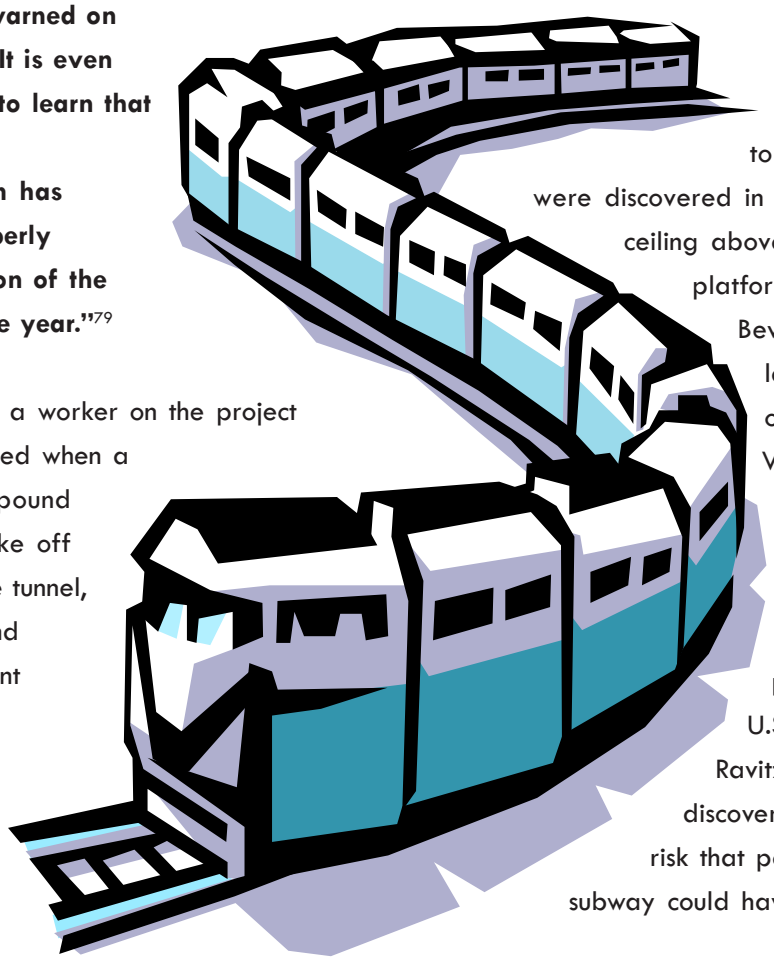
Private management and inspection consultants were faulted for devoting "little attention" to construction specifications.

Responding to these revelations, MTA Board member and Los Angeles County Supervisor Edward 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."[79]

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.[80]

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.



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. Because of the bad welds, metal or rock might have fallen on passengers. 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."[81]

VI. A First Step: Accountability in Contracting

As Congress prepares to reauthorize the major federal program funding state transportation programs – the Transportation Equity Act for the 21st Century (TEA-21) – it confronts the question of how to provide what these projects lack: accountability for how the taxpayers money is spent on private consultants.

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 an amendment that was introduced in 1997 to the Highways Appropriations Bill. Although the amendment was not enacted, the proposal's provisions provide lessons for those who are who preparing to debate and decide how to protect the taxpayers' right to know how, where, and why their money is being spent.

The amendment proposed that federal highway funds could not be used by state and local governments for contracts with private firms to perform work usually done by public employees unless they first conduct a cost-benefit analysis of the project detailing the costs of personnel, fringe benefits, and administering the service. In order to justify the contract, the agency would need to show that the use of outside consultants would result in a cost savings that would not be outweighed by the public's interest in having a particular function performed by career public employees. This requirement replicates the procedure that the federal government itself follows before it awards contracts to private companies.

While this amendment would not prevent all the problems involved in contracting-out the design, engineering, inspection, and supervision of transportation projects, it would require state and local departments to prove that they are saving money by hiring consultants to do this work.

Additionally, this requirement could trigger other positive practices by state 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 more 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.

That's why passing an "accountability in contracting" requirement would lead federal, state and local 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 contracted-out.

VII. 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.

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 and local 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" amendments as Congress considers reauthorizing the major federal transportation program. One model is an amendment that was proposed in 1997 to the Highways Appropriations Bill that would have required that, before state and local transportation departments hire outside consultants for engineering and related functions, they must conduct cost-benefit analyses showing that contracting-out would result in cost savings that would not be outweighed by the public's interest in having these functions performed by career public employees.

While it is not a cure-all for all the issues involving the cost, quality, safety, and timely delivery of transportation projects, this "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 state and local agencies 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 agency 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 and local transportation departments could no longer rely routinely on consultant engineers, they would need to do more to retain engineering and technical employees and recruit qualified professionals as older workers retire.

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

• **Contracting-out is growing uncontrollably:** Unless they are required to justify their use of consultants, state and local transportation departments will continue to contract-out 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 cost 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 and local 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.

- **Consultants cost more than state engineers:** Conducting cost-benefit analyses will also call attention to the inescapable fact that contracting-out costs more than making use of publicly employed engineers and technical staff. More than 80% of comparative studies have found that contracting-out engineering, design, and inspection costs more than doing 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 and local transportation departments will be irreversible:** Skilled and dedicated professionals have been leaving government 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 publicly employed engineers who then solicit contracts from their former colleagues. Now that the "baby boom" generation of engineers is preparing to retire, state and local transportation departments have a window of opportunity 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 and local 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 public agency engineers cannot do the job, or when a cost-benefit study has demonstrated that contracting-out 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 and local 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 Legislative Scrutiny:** Legislators and other public officials should take a closer look at the use of consultant engineers by transportation agencies. Legislators should not accept the budgetary sleight-of-hand that allows 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 and local government 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.

- **Rebuilding State Engineering Workforces:** Now that the "baby boom" generation is preparing to retire, state and local 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 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 and local government engineers and technical employees who are guardians of the people's safety and the taxpayers' money, not by private consultants who are teammates with the firms that engineered and designed the projects. 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. Transportation departments should also avoid compromising relationships such as developed in Massachusetts' "Big Dig," where state employees were supervised by employees of a partnership of private companies that managed the project.

Together with "accountability in contracting" provisions in the federal programs, 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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