

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 "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.^{xxxix}

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.”^{xi}

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 kept growing along with the partnership’s responsibilities and its role in the state agencies that were supposed to be supervising it.

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.”^{xii}

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.^{xiii}

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.”^{xiii}

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, have soared. By April 2000, construction costs had increased by 17% over original bids, while design contracts had skyrocketed by 82%.^{xliv}

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.

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."^{xlv} Similarly, the Globe reported:

"At both the South 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."^{xlvi}

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 that "Bechtel/Parsons-Brinckerhoff's overly broad role in management undermines the Commonwealth's ability to hold Bechtel/Parsons Brinckerhoff accountable for its design work."^{xlvii} 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."^{xlviii}

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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.^{xlix} 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.^l

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."^{li}

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.^{lii}

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 Supervision 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.”^{liii}

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.^{liv}

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.”^{lv}