



# NYSDOT Engineering Design Costs:

## In-House Versus Outsourced Design

### Executive Summary

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# Executive Summary

This study objectively analyzes and compares the cost of having public-sector design work performed in-house with contracting out that same work to private engineering consulting companies.

The percentage of work performed in-house versus that which is contracted out varies among New York State agencies and authorities. To accomplish their programs and in-house training goals, many agencies set design workload targets of 25% in-house and 75% outsourced. This guideline was, for example, used by the U.S. Army Corps of Engineers, New York District, from 1983 to 1986, and is currently in use by the New York State Thruway Authority. The New York State Department of Transportation (NYSDOT) has traditionally reported that it performs 50% or more of its work with in-house forces, although in some regions the in-house design percentage is as high as approximately 80%. As we believe this to be a very high percentage of in-house work when compared with other New York State agencies and authorities, we have chosen to focus this comparison of cost-effectiveness on transportation projects and the NYSDOT. (While a few studies have been conducted in the past, these studies were primarily based on subjective analysis using extremely limited, if any, data.)

It might be anticipated that the cost of a design engineer would be the same whether he or she is in the public or private sector; however, this study found that because of the generous benefits package provided by the State of New York, the large amount of paid time off, and a reduced work week compared to the private sector, the in-house design engineer actual expected cost to the taxpayer exceeds the cost of a private design engineer by approximately 14%. These calculations are based on conservative assumptions: in all probability, the actual difference exceeds this cost considerably. The total cost of a career NYSDOT employee to taxpayers is in excess of \$5.5 million over a 30-year career.

The cost of the pension system in the state has risen from \$1 billion in 2000 to about \$7.5 billion in 2006. Based on our assumptions, New York has understated its contributions to the retirement system by about 8.8%. In our calculations we used a state contribution of 9.61% (which comes directly from the NYSDOT), and an employee contribution of 3.0%. To cover the cost of an individual retirement plan, a total contribution of 21.5% is required. Were this to be included in the calculations in this report, an additional \$5,500 could be added to a NYSDOT employee's expected annual salary.

We also performed a stochastic simulation to allow for variations in assumptions. Based on these simulations, we have an 80% assurance that the annual cost to the taxpayer for a NYSDOT design engineer will be between \$166,200 and \$214,695. Our analysis indicated that the average annual cost to the taxpayer for a private-sector consultant design engineer is approximately \$162,829. As shown by this analysis, even the lower value of in-house range is still slightly greater than the expected cost to the taxpayer of a consultant design engineer.

In addition to cost, it is beneficial for the public sector to outsource work due to the following reasons:

1. **Decision based on policy.** The government is not meant to perform functions that private organizations can perform equally well. Government design and construction agencies should be leaders in a public-private partnership team.
2. **Decision based on staffing capacity.** The public cannot afford to staff an agency to handle peak workloads. If the DOT staffed up to handle peak workloads, it is liable to pay those employees in lean times even if they have nothing to work on. If a project is outsourced, consultant employees are only paid for the time they work on it; they leave a project once it is over.
3. **Decision based on schedule constraints.** This issue is based on capacity, expertise, and attitude and must be addressed to complete critical projects on time. Consultants have more flexibility to meet fast-track deadlines than government agencies.
4. **Decision based on lack of special expertise.** Often the DOT has no choice but to outsource the design if it lacks the required expertise in-house.
5. **Decision based on the need for innovation.** The private sector has more means to encourage innovation than government agencies, including bonus programs and the sharing of intellectual properties. Most government agencies cannot by regulation provide these types of incentives.
6. **Decision based on better management of risks.** A contract is a risk management tool that enables certain risks to be shifted to a consultant who has control over the design.
7. **Decision based on improving quality.** Since consultants compete against one another for work, they cannot submit a poor-quality design and expect to be selected again by the same agency. Past performance is a major gatekeeper in the selection of consultants.
8. **Decision based on cost-effectiveness.** Even though the cost of design is usually less than 1% of the total life-cycle cost of a facility, the designer still has a large influence on what those life-cycle costs will ultimately be. Therefore, it is important that the consultant for each project be selected by a state agency utilizing the Qualifications-Based Selection (QBS) process as mandated by federal and New York State legislation.

In summary, the governor's office, the state legislature, and all state agencies should take advantage of the lower costs and enhanced benefits that the private sector provides in developing and implementing its design and construction programs; this will result in immediate and long-term benefits to all New York taxpayers.

